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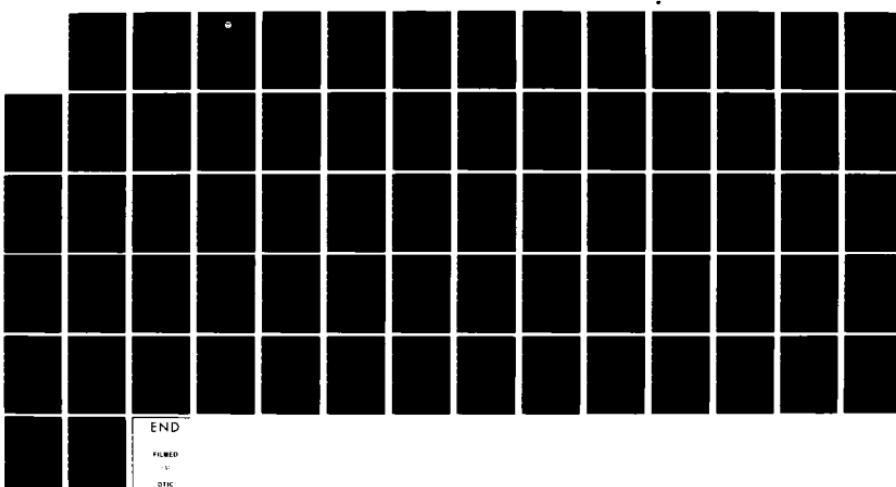
EVALUATING J SUB N(2) VIA SERIES REPRESENTATION(U)
NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA J CARROLL
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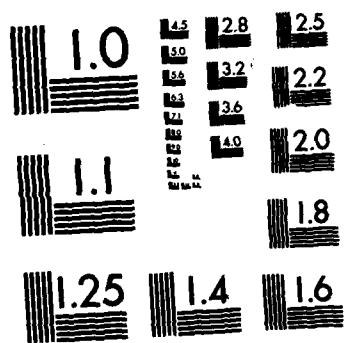


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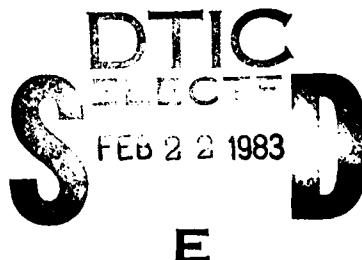
EVALUATING $J_N(z)$ VIA SERIES REPRESENTATION

Joel Carroll

28 October 1982

Prepared for
Naval Sea Systems Command
(PMS-406)

ADA 124690



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ADMINISTRATIVE INFORMATION

The work reported here was performed as part of the Advanced Lightweight Torpedo Target Modeling Program by members of the Weapons Technology Division under program element 63610N, project WT16, and subproject S0199-AS. Sponsorship was provided by the Naval Sea Systems Command (PMS-406).

Released by

J.C. Reeves, Head
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) An algorithm and subroutine for evaluating $J_N(z)$ were developed to be used in determining the scattering of plane elastic waves from a single, hollow cylindrical cavity. Two series were developed for computation purposes: one for the real part of $J_N(z)$ and one for the imaginary part of $J_N(z)$. The subroutine utilizes double-precision arithmetic. The output includes the complex number EZ where the real and imaginary parts represent the magnitudes of upper bounds of errors in respective parts of $J_N(z)$. Computational studies strongly suggest that for $ z \leq 10$, the magnitudes of the error in the real and imaginary parts of $J_N(z)$ are less than 10^{-6} . From the same studies, computational times were always less than 0.04 second.	O.000001	

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OBJECTIVE

Develop an algorithm and subroutine for evaluating $J_N(z)$ to be used in determining the scattering of plane elastic waves from a single, hollow cylindrical cavity. Optimal accuracy and computation time are both essential.

RESULTS

1. Two series were developed for computational purposes: one for the real part of $J_N(z)$ and one for the imaginary part of $J_N(z)$.
2. A subroutine was developed for evaluating $J_N(z)$ by utilizing double-precision arithmetic. Included in the output is the complex number EZ where the real and imaginary parts represent the magnitudes of upper bounds of errors in respective parts of $J_N(z)$.
3. Computational studies strongly suggest that for $|z| \leq 10$, the magnitudes of the errors in the real and imaginary parts of $J_N(z)$ are less than 10^{-6} . From the same studies, computational times were always less than 0.04 second.

RECOMMENDATIONS

1. Although the motivation for designing the algorithm and subroutine for computing $J_N(z)$ was for use in the specified scattering problem, satisfactory usage in a wide range of scientific problems is projected.
2. Subroutine JNZ can also be used for Bessel functions of real arguments by setting the imaginary part of z to zero. Computational studies show a high degree of accuracy (magnitude of the maximum error less than 10^{-6}) for z taking on integer values from 1 to 10.

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INTRODUCTION

Computational methods for evaluating Bessel functions of the first kind have been a necessary part of scientific research and technology for generations. Exhaustive tables [1] have been published for real arguments, while a similar publication for complex arguments [2] is much more limited in scope.

A recent need arose at NOSC for these functions with complex arguments in determining the scattering of plane elastic waves from a single hollow cylindrical cavity. To meet this need, priorities of accuracy and computational time were set as number one and number two goals, respectively.

ALGORITHM

Although some analysts will question the efficiency of the series representation for computational purposes (both in terms of accuracy and computational time), this study shows that the approach does reasonably well. Of course, no universal algorithm has been designed to successfully compute $J_N(z)$ for the entire domain of existence [3] of the complex numbers.

The series representation of the Bessel function is given by:

$$J_N(z) = \left(\frac{1}{2}z\right)^N \sum_{K=0}^{\infty} \frac{(-\frac{1}{4}z^2)^K}{K!(N+K)!}$$

$$= U + iV,$$

for $z = \rho (\cos \theta + i \sin \theta)$.

1. Harvard Computation Laboratory Annals, vol III-IX, Harvard University Press, Cambridge, MA, 1947-48.
2. Tables of the Bessel Functions $J_0(z)$ and $J_1(z)$ for Complex Arguments, Columbia University Press, New York, 1943.
3. Private consultation with Dr Gordon Martin.

The real and imaginary parts, U and V , are

$$U = \left(\frac{\rho}{2}\right)^N \sum_{K=0}^{\infty} \frac{(-1)^K \rho^{2K} \cos (N+2K)\theta}{2^{2K} \Gamma(K+1) \Gamma(N+K+1)},$$

$$V = \left(\frac{\rho}{2}\right)^N \sum_{K=0}^{\infty} \frac{(-1)^K \rho^{2K} \sin (N+2K)\theta}{2^{2K} \Gamma(K+1) \Gamma(N+K+1)}.$$

Thus we have two independent series representing the real and imaginary parts of the Bessel function.

COMPUTATIONAL RESULTS AND CONCLUSIONS

All programming for this report was done in ASCII Fortran for the UNIVAC 1100/82.

The subroutine for computing $J_N(z)$ is referenced by the statement

```
CALL JNZ (JN,NP1, Z, EZ)
```

where

J_N will contain the double-precision complex output $J_N(z)$

NP1 is the integer order of the Bessel function

Z is the double-precision complex argument

EZ is a double-precision complex number with the real and imaginary parts being upper bounds for the magnitudes of respective parts of the relative error in J_N .

Subroutine JNZ carries out the computations in double-precision arithmetic and uses double-precision system subroutines:

DREAL, DIMAG, DSQRT, DATAN2, DSIN, DCOS, DGAMMA, DCMPLX.

Since reference 1 was available for comparison of computations with real arguments, it was decided to compute $J_N(z)$ for $N = 1, 2, \dots, 27$, and $z = 1, 2, 3, \dots, 15$. In general, the comparisons showed the magnitudes of the differences to be less than 10^{-8} in the worse cases [12 values of $J_N(z)$] for $z = 1, 2, 3, 4$, and 5. For $N \geq 9$, the computations agreed for the 10 places of output with reference 1. For $z = 6, 7, 8, 9$, and 10, two values showed comparison differences greater than 10^{-8} but less than 10^{-7} . All other differences were significantly less than 10^{-8} . For these same cases ($z = 6$ to 10), the computations agreed with reference 1 for the 10 places of output for $N \geq 14$. The computations for $z = 11, 12, 13, 14$, and 15 showed significantly larger differences than the other computations.

In general, whenever differences were noted between reference 1 and the computations for $z = 1$ to 10, the magnitudes of the computations were less than the corresponding magnitudes of reference 1. For $z = 11$ to 15, the computational values were algebraically less than corresponding values given in reference 1.

Tables 1 through 26 represent some results for selected values for the argument z , where 'N' is the order of J_N , J_N is the computed complex values of the Bessel function, and the time of computation (TIME) is given in seconds. Listed under the heading BESL.EQ., are the complex values of the Bessel equation for the specified J_N as its solution. (Note that the value of the Bessel equation should be zero when satisfied.) Listed under the heading, REL.ERROR, is the output 'EZ' from the subroutine JNZ.

The following expression is the Bessel equation given in terms of its solution $J_N(z)$.

$$\frac{z^2}{4} \left[J_{N-2}(z) + \frac{2}{z} J_{N-1}(z) - 2J_N(z) - \frac{2}{z} J_{N+1}(z) + J_{N+2}(z) \right] + (z^2 - N^2) J_N(z) = 0.$$

Therefore, the values listed under the heading, BESL.EQ., represent 'complex zeros' and along with values listed under REL.ERROR give some indications of the quality of the computations. From this standpoint, tables 16, 17, and 18 are the worst results.

Although the number of computations carried out here has not been exhaustive, it is conceivable that for $|z| \leq 10$, JNZ can carry sufficient accuracy for many needs. Additional computational studies strongly suggest that for $|z| \leq \sqrt{57}$, the magnitudes of the real and imaginary parts of both EZ and the error in the computational value of the Bessel equation are less than 10^{-9} .

TABLES 1 THROUGH 26

TABLE 1 FOR Z=(1.0, 1.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(.61416033, .36502803)	(.0000000000, .0000000000)	.02280	(.3857303-035, .6489920-035)
2	(.04157989, .24739764)	(.0000000000, .0000000000)	.02320	(.2120380-035, .3563702-036)
3	(-.03620528, .04666748)	(.0000000000, .0000000000)	.02340	(.8609542-037, .6688001-037)
4	(-.01037328, .00104063)	(.0000000000, .0000000000)	.02400	(.1011816-037, .1008602-036)
5	(-.00112531, -.00095183)	(.0000000000, .0000000000)	.03060	(.2997840-038, .3544233-038)
6	(-.00001239, -.00017322)	(.0000000000, .0000000000)	.02520	(.8368335-038, .5987284-039)
7	(.00001160, -.00001315)	(.0000000000, .0000000000)	.02600	(.2633186-039, .2323028-039)
8	(.00000155, -.0000009)	(.0000000000, .0000000000)	.02660	(.5583415-040, .1003999-038)
9	(.0000009, .0000008)	(.0000000000, .0000000000)	.02700	(.2602364-040, .2876534-040)
10	(.0000000, .0000001)	(.0000000000, .0000000000)	.02780	(.1573043-039, .7155059-041)
11	(.0000000, .0000000)	(.0000000000, .0000000000)	.02820	(.4147570-041, .3815582-041)
12	(.0000000, .0000000)	(.0000000000, .0000000000)	.03480	(.1162835-041, .3021894-040)
13	(.0000000, .0000000)	(.0000000000, .0000000000)	.02940	(.6879693-042, .7389523-042)
14	(.0000000, .0000000)	(.0000000000, .0000000000)	.02960	(.6823323-041, .2275278-042)
15	(.0000000, .0000000)	(.0000000000, .0000000000)	.03020	(.1556886-042, .1462500-042)
16	(.0000000, .0000000)	(.0000000000, .0000000000)	.03060	(.5170504-043, .1757467-041)
17	(.0000000, .0000000)	(.0000000000, .0000000000)	.03100	(.3557108-043, .3760424-043)
18	(.0000000, .0000000)	(.0000000000, .0000000000)	.03140	(.5050759-042, .1329452-043)
19	(.0000000, .0000000)	(.0000000000, .0000000000)	.03800	(.1017708-043, .9680532-044)
20	(.0000000, .0000000)	(.0000000000, .0000000000)	.03220	(.3792511-044, .1592555-042)
21	(.0000000, .0000000)	(.0000000000, .0000000000)	.03260	(.2898050-044, .3032866-044)
22	(.0000000, .0000000)	(.0000000000, .0000000000)	.03300	(.5437397-043, .1182229-044)
23	(.0000000, .0000000)	(.0000000000, .0000000000)	.03320	(.9817957-045, .9417167-045)
24	(.0000000, .0000000)	(.0000000000, .0000000000)	.03300	(.3979072-045, .1989272-043)
25	(.0000000, .0000000)	(.0000000000, .0000000000)	.03920	(.3286305-045, .3415196-045)
26	(.0000000, .0000000)	(.0000000000, .0000000000)	.03320	(.7732323-044, .1432075-045)
27	(.0000000, .0000000)	(.0000000000, .0000000000)	.03320	(.1265357-045, .1220954-045)

TABLE 2 FOR Z=1, 1.0, 9.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(836.40934830, 598.33271369)	(-.0000000056,	.0000000078)	.02260	(.4740937-010, .6627356-010)
2	(-488.54308327, 713.12806864)	(-.0000001009,	.0000001772)	.02320	(.1934209-010, .1325070-010)
3	(-547.16010271, -349.06364939)	(-.0000000443,	-.0000000190)	.02360	(.3909659-011, .6128422-011)
4	(218.63579445, -378.34436559)	(.0000000031,	-.0000000103)	.02400	(.2109549-011, .1219056-011)
5	(236.28561531, 120.17911128)	(.0000000223,	.000000004)	.02460	(.4017241-012, .7898347-012)
6	(-57.91657288, 133.66248430)	(.000000000,	.000000005)	.02520	(.3226350-012, .1397992-012)
7	(-68.71793934, -24.33838345)	(-.000000001,	.000000000)	.02560	(.5129911-013, .1448399-012)
8	(8.78623793, -32.22683810)	(.000000000,	.000000000)	.02640	(.7266310-013, .1981067-013)
9	(13.83885543, 2.62072892)	(.000000000,	.000000000)	.02700	(.8033787-014, .4242271-013)
10	(-57090277, 5.46194225)	(.000000000,	.000000000)	.03380	(.3265664-013, .3413395-014)
11	(-1.98847068, -0.3534667)	(.000000000,	.000000000)	.02820	(.1516119-014, .8529116-013)
12	(-0.04793863, -0.66999630)	(.000000000,	.000000000)	.02880	(.9818515-014, .7025206-015)
13	(.20957157, -0.03447243)	(.000000000,	.000000000)	.02920	(.3389649-015, .2060702-014)
14	(.01601561, -0.06102032)	(.000000000,	.000000000)	.02980	(.6478269-015, .700309-015)
15	(-0.01657697, .00608994)	(.000000000,	.000000000)	.03020	(.8855727-016, .2410550-015)
16	(-0.00202811, -0.00420959)	(.000000000,	.000000000)	.03680	(.9931194-016, .4784679-016)
17	(-.00100062, -.00060960)	(.000000000,	.000000000)	.03100	(.2680529-016, .4399927-016)
18	(.00016815, .00022280)	(.000000000,	.000000000)	.03140	(.2063484-016, .1557341-016)
19	(-.00004647, .00004302)	(.000000000,	.000000000)	.03200	(.9391424-017, .1714503-016)
20	(-.00001028, -.00000907)	(.000000000,	.000000000)	.03240	(.5194819-017, .5820185-017)
21	(.00000165, -0.00000231)	(.000000000,	.000000000)	.03260	(.3856329-017, .2757593-017)
22	(.00000049, .00000028)	(.000000000,	.000000000)	.03300	(.1512256-017, .2652751-017)
23	(-.00000004, .00000010)	(.000000000,	.000000000)	.03920	(.1940129-017, .8544748-018)
24	(-.00000002, -.00000001)	(.000000000,	.000000000)	.03300	(.4964202-018, .1544112-017)
25	(.00000000, .00000000)	(.000000000,	.000000000)	.03320	(.1411360-017, .2960522-018)
26	(.00000000, .00000000)	(.000000000,	.000000000)	.03300	(.1810115-018, .1767793-017)
27	(.00000000, .00000000)	(.000000000,	.000000000)	.03300	(.3676066-016, .1133574-018)

TABLE 3 FOR Z=(2.0, -8.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(375.22488837, 124.04942485)	(-0.000000006, -0.000000001)	.02260	(.3991673-011,	.1207402-010)
2	(118.19933724, -305.96493159)	(-.0000000050, .000000008)	.02300	(.2749808-011,	.1062297-011)
3	(-217.33558677, -104.42208163)	(-.000000001, .0000000013)	.02340	(.3083054-012,	.6416816-012)
4	(-82.84297140, 134.12415005)	(-.000000002, .000000001)	.02360	(.1588040-012,	.9808669-013)
5	(71.60862874, 58.01084974)	(-.000000001, .000000000)	.02440	(.3443131-013,	.4250203-013)
6	(35.65627427, -32.81668984)	(-.000000000, .000000000)	.02520	(.1239594-013,	.1346855-013)
7	(-12.69461688, -19.25494131)	(-.000000000, .000000000)	.02560	(.5981486-014,	.3943542-014)
8	(-9.16944848, 3.97940386)	(-.000000000, .000000000)	.02620	(.1365746-014,	.3146988-014)
9	(.88893974, 3.86746364)	(.000000000, .000000000)	.02680	(.2234045-014,	.5134971-015)
10	(1.45014064, -.04946248)	(-.000000000, .000000000)	.02760	(.2091293-015,	.6131251-014)
11	(.08046646, -.48446360)	(-.000000000, .000000000)	.02800	(.5549789-015,	.9217863-016)
12	(-.14416832, -.05574784)	(-.000000000, .000000000)	.02860	(.4404007-016,	.1138911-015)
13	(-.02482667, .03804868)	(-.000000000, .000000000)	.02900	(.3514816-016,	.2293409-016)
14	(.00879902, .00890348)	(-.000000000, .000000000)	.03560	(.1319915-016,	.1303539-016)
15	(.00274380, -.00173140)	(-.000000000, .000000000)	.03020	(.5450118-017,	.8636960-017)
16	(-.00026720, -.00074719)	(-.000000000, .000000000)	.03040	(.6992625-017,	.2500563-017)
17	(-.00018233, .00002225)	(-.000000000, .000000000)	.03080	(.1242689-017,	.1018269-016)
18	(-.00000414, .00004013)	(-.000000000, .000000000)	.03140	(.6452408-017,	.6650936-018)
19	(.00000798, .00000272)	(-.000000000, .000000000)	.03160	(.3831949-018,	.1123324-017)
20	(.00000089, -.00000143)	(-.000000000, .000000000)	.03200	(.3841909-018,	.2389589-018)
21	(-.00000023, -.00000023)	(-.000000000, .000000000)	.03860	(.1636692-018,	.1636211-018)
22	(-.00000005, .00000003)	(-.000000000, .000000000)	.03280	(.7903741-019,	.1275196-018)
23	(.00000000, .00000001)	(-.000000000, .000000000)	.03300	(.1248349-018,	.4183074-019)
24	(.00000000, .00000000)	(-.000000000, .000000000)	.03300	(.2388868-019,	.2623761-018)
25	(.00000000, .00000000)	(-.000000000, .000000000)	.03280	(.1018890-018,	.1463228-019)
26	(.00000000, .00000000)	(-.000000000, .000000000)	.03300	(.9617554-020,	.2429949-019)
27	(.00000000, .00000000)	(-.000000000, .000000000)	.03920	(.9741434-020,	.6835184-020)

TABLE 4 FOR Z=(2.0, -2.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(1.61701879, .27260958)	(.0000000000, .0000000000)	.02280	(.5033851-025,	.2985893-024)
2	(.64455012, -.83518078)	(.0000000000, .0000000000)	.02320	(.9399832-026,	.7254313-026)
3	(-1.3728788, -.46324024)	(.0000000000, .0000000000)	.02360	(.3120539-026,	.9248164-027)
4	(-.15562160, -.06561140)	(.0000000000, .0000000000)	.02380	(.1653906-027,	.4397220-027)
5	(-.04273250, .02077424)	(.0000000000, .0000000000)	.03040	(.4340018-028,	.8927392-028)
6	(-.00314526, .01071575)	(.0000000000, .0000000000)	.02520	(.3625602-028,	.1064178-028)
7	(.00114945, .00193723)	(.0000000000, .0000000000)	.02580	(.5845875-029,	.3468636-029)
8	(.000388803, .00008765)	(.0000000000, .0000000000)	.02640	(.9796054-030,	.4336761-029)
9	(.00005207, -.00003452)	(.0000000000, .0000000000)	.02700	(.3971060-030,	.5989809-030)
10	(.00000160, -.00000868)	(.0000000000, .0000000000)	.02780	(.6783323-030,	.1246924-030)
11	(-.00000066, -.00000092)	(.0000000000, .0000000000)	.02820	(.8309070-031,	.5916235-031)
12	(-.00000013, -.00000002)	(.0000000000, .0000000000)	.03480	(.2018514-031,	.1301766-030)
13	(-.00000001, .00000001)	(.0000000000, .0000000000)	.02920	(.1079858-031,	.1442669-031)
14	(.00000000, .00000000)	(.0000000000, .0000000000)	.02980	(.2937341-031,	.3939656-032)
15	(.00000000, .00000000)	(.0000000000, .0000000000)	.03000	(.2984018-032,	.2317835-032)
16	(.00000000, .00000000)	(.0000000000, .0000000000)	.03080	(.8937595-033,	.7562080-032)
17	(.00000000, .00000000)	(.0000000000, .0000000000)	.03100	(.5681583-033,	.7108556-033)
18	(.00000000, .00000000)	(.0000000000, .0000000000)	.03760	(.2172516-032,	.2295302-033)
19	(.00000000, .00000000)	(.0000000000, .0000000000)	.03180	(.1903294-033,	.1556192-033)
20	(.00000000, .00000000)	(.0000000000, .0000000000)	.03220	(.6542024-034,	.68484227-033)
21	(.00000000, .00000000)	(.0000000000, .0000000000)	.03260	(.4683933-034,	.5623558-034)
22	(.00000000, .00000000)	(.0000000000, .0000000000)	.03280	(.2337779-033,	.2037973-034)
23	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.1807736-034,	.1529029-034)
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.6855765-035,	.8551468-034)
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03920	(.5356938-035,	.6251668-035)
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.3323565-034,	.2466401-035)
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.23048899-035,	.1997092-035)

TABLE 5 FOR Z=(3.0, 3.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(1.63645140, -3.27863344)	(.000000000, .000000000)	.02280	(.7242798-019, .3615069-019)
2	(2.81910682, .45706761)	(.000000000, .000000000)	.02340	(.4694081-020, .2895221-019)
3	(.54766488, 1.70394064)	(.000000000, .000000000)	.02360	(.2562852-020, .8237282-021)
4	(-.56750130, .69920815)	(.000000000, .000000000)	.02400	(.2498380-021, .2027771-021)
5	(-.37205574, -.01499470)	(.000000000, .000000000)	.02460	(.3674522-022, .9117401-021)
6	(-.07758278, -.10410641)	(.000000000, .000000000)	.02540	(.1625257-022, .1211183-022)
7	(.00867736, -.03805257)	(.000000000, .000000000)	.02580	(.1284383-022, .2926858-023)
8	(.00904063, -.00493009)	(.000000000, .000000000)	.02660	(.1046044-023, .1918199-023)
9	(.00228407, .00079732)	(.000000000, .000000000)	.02700	(.3378102-024, .9677122-024)
10	(.00020355, .00046987)	(.000000000, .000000000)	.03400	(.2978224-024, .1290180-024)
11	(-.00003935, .00009040)	(.000000000, .000000000)	.02820	(.1167016-024, .5080415-025)
12	(-.00001638, .00000590)	(.000000000, .000000000)	.02880	(.2051264-025, .5689620-025)
13	(-.00000254, -.00000127)	(.000000000, .000000000)	.02920	(.9358693-026, .1869803-025)
14	(-.00000013, -.00000041)	(.000000000, .000000000)	.02980	(.1280017-025, .3958631-026)
15	(.00000003, -.00000005)	(.000000000, .000000000)	.03020	(.3671314-026, .2025899-026)
16	(.00000001, .00000001)	(.000000000, .000000000)	.03660	(.8913030-027, .3288601-026)
17	(.00000000, .00000000)	(.000000000, .000000000)	.03100	(.5002759-027, .8433107-027)
18	(.00000000, .00000000)	(.000000000, .000000000)	.03140	(.9433886-027, .2276868-027)
19	(.00000000, .00000000)	(.000000000, .000000000)	.03200	(.2198095-027, .1379365-027)
20	(.00000000, .00000000)	(.000000000, .000000000)	.03240	(.6464366-028, .2970573-027)
21	(.00000000, .00000000)	(.000000000, .000000000)	.03260	(.4176110-028, .6362117-028)
22	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1013182-027, .2007912-028)
23	(.00000000, .00000000)	(.000000000, .000000000)	.03920	(.2012091-028, .1370366-028)
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.6739441-029, .3703726-028)
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.4823376-029, .6867126-029)
26	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1438715-028, .2420254-029)
27	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.2504348-029, .1805657-029)

TABLE 6 FOR Z=(3.0, 7.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(-47.81936364, -143.39837964)	(-0.0000000001, .0000000000)	.02280	(.1936095-011,	.6456338-012)
2	(-121.55481076, 29.07368380)	(-0.000000003, -0.000000001)	.02300	(.1526472-012,	.6382059-012)
3	(-8.63452095, 90.73199178)	(.000000000, -.000000001)	.02340	(.4091444-012,	.3893626-013)
4	(-58.53201287, 5.33710468)	(.000000000, .000000000)	.02380	(.1094425-013,	.1200256-012)
5	(-10.43255571, -32.00986708)	(.000000000, .000000000)	.02440	(.1062797-013,	.3463834-014)
6	(14.50326517, -9.30291697)	(.000000000, .000000000)	.02500	(.1265702-014,	.1973231-014)
7	(5.96139227, 5.23091388)	(.000000000, .000000000)	.02580	(.4885648-015,	.5567911-015)
8	(-1.34795420, 3.01812283)	(.000000000, .000000000)	.03240	(.3291082-015,	.1469863-015)
9	(-1.24884132, -1.3021101)	(.000000000, .000000000)	.02700	(.5202562-016,	.4989727-015)
10	(-.09763231, -4.2635367)	(.000000000, .000000000)	.02760	(.9385365-016,	.2149190-016)
11	(.11871283, .07518031)	(.000000000, .000000000)	.02800	(.1049719-016,	.1657550-016)
12	(.03310263, .02560061)	(.000000000, .000000000)	.02860	(.4943041-017,	.6391552-017)
13	(-.00346641, .01107691)	(.000000000, .000000000)	.02900	(.5991552-017,	.1874999-017)
14	(-.00300578, .00017328)	(.000000000, .000000000)	.02960	(.8487582-018,	.1472316-016)
15	(-.00030124, -.00066848)	(.000000000, .000000000)	.03620	(.1007785-017,	.4541389-018)
16	(.00011800, -.00011989)	(.000000000, .000000000)	.03060	(.2968762-018,	.2921981-018)
17	(.00003353, .00001433)	(.000000000, .000000000)	.03100	(.1169954-018,	.2737066-018)
18	(-.00000021, .00000749)	(.000000000, .000000000)	.03140	(.2081042-017,	.5698850-019)
19	(-.00000050, -.00000050)	(.000000000, .000000000)	.03180	(.3288167-019,	.8957239-019)
20	(-.00000018, -.00000020)	(.000000000, .000000000)	.03820	(.2552859-019,	.2299890-019)
21	(.00000002, -.00000004)	(.000000000, .000000000)	.03240	(.2200357-019,	.1073724-019)
22	(.00000001, .00000000)	(.000000000, .000000000)	.03280	(.5565224-020,	.8085115-019)
23	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1039430-019,	.3422541-020)
24	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.2543368-020,	.2981362-020)
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1315283-020,	.2557021-020)
26	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.8493679-020,	.7199387-021)
27	(.00000000, .00000000)	(.000000000, .000000000)	.03880	(.4679409-021,	.1476276-020)

TABLE 7 FOR Z=(4.0, -6.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR	
1	(-32.22960124,	47.40785875)	(.000000000,	.000000000)	.02280	(.4249562-012,	.2889008-012)
2	(-35.84847449,	31.83102460)	(.000000000,	.000000000)	.02320	(.7250142-013,	.8165195-013)
3	(28.56865896,	-21.06824757)	(.000000000,	.000000000)	.02360	(.1640095-013,	.2223978-013)
4	(-8.0722973,	-21.77652881)	(.000000000,	.000000000)	.02380	(.9959759-014,	.3694219-014)
5	(-13.43785066,	.21140240)	(.000000000,	.000000000)	.03080	(.9811388-015,	.6236635-013)
6	(-2.50350432,	6.43393374)	(.000000000,	.000000000)	.02520	(.8255735-015,	.3212384-015)
7	(2.21839996,	2.26122276)	(.000000000,	.000000000)	.02600	(.1399667-015,	.1373160-015)
8	(1.23980597,	-41520159)	(.000000000,	.000000000)	.02660	(.3611956-016,	.1978542-015)
9	(.07404110,	-48336754)	(.000000000,	.000000000)	.02700	(.8387291-016,	.1284745-016)
10	(-1.13337033,	-10029888)	(.000000000,	.000000000)	.02760	(.6217893-017,	.8268112-017)
11	(-0.4776726,	.02128389)	(.000000000,	.000000000)	.02820	(.2235557-017,	.5017242-017)
12	(-.00149491,	.01506243)	(.000000000,	.000000000)	.03480	(.8881257-017,	.881444C-018)
13	(.00329607,	.00238392)	(.000000000,	.000000000)	.02920	(.4841090-018,	.6693430-018)
14	(.00093530,	-.00040637)	(.000000000,	.000000000)	.02960	(.1984253-018,	.4566987-018)
15	(-.00003131,	-.00023742)	(.000000000,	.000000000)	.03020	(.6678347-018,	.8807497-019)
16	(-.00004121,	-.00003314)	(.000000000,	.000000000)	.03060	(.5544707-019,	.6894014-019)
17	(-.00001037,	-.00000370)	(.000000000,	.000000000)	.03100	(.2335275-019,	.6543035-019)
18	(-.00000046,	.00000212)	(.000000000,	.000000000)	.03740	(.5472510-019,	.1175459-019)
19	(.00000029,	.00000028)	(.000000000,	.000000000)	.03200	(.8563107-020,	.8845050-020)
20	(.00000007,	-.00000002)	(.000000000,	.000000000)	.03220	(.3468724-020,	.1410253-019)
21	(.00000000,	-.00000001)	(.000000000,	.000000000)	.03260	(.5956318-020,	.1984878-020)
22	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300	(.1698435-020,	.1385195-020)
23	(.00000000,	-.00000000)	(.000000000,	.000000000)	.03340	(.6274902-021,	.5323557-020)
24	(.00000000,	.00000000)	(.000000000,	.000000000)	.03320	(.8440259-021,	.4089166-021)
25	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300	(.4226955-021,	.2589736-021)
26	(.00000000,	.00000000)	(.000000000,	.000000000)	.03920	(.1345513-021,	.6234720-020)
27	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300	(.1485065-021,	.1002987-021)

TABLE 8 FOR Z=(4.0, -4.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(-4.33745299, 7.56139379)	(.0000000000, .0000000000)	.02280	(.6448081-015, .3684204-015)
2	(5.40211747, 4.84169783)	(.0000000000, .0000000000)	.02320	(.7707129-016, .8599218-016)
3	(4.61766281, -2.46948615)	(.0000000000, .0000000000)	.02340	(.1275115-016, .2384323-016)
4	(-0.08675575, -3.23056533)	(.0000000000, .0000000000)	.02400	(.9141112-016, .2454815-017)
5	(-1.47385323, -7.84783493)	(.0000000000, .0000000000)	.02440	(.6917759-018, .1202564-017)
6	(-6.69576712, .32845512)	(.0000000000, .0000000000)	.02520	(.1802075-018, .3817339-018)
7	(-0.6248013, .29686694)	(.0000000000, .0000000000)	.02580	(.2364986-018, .4977471-019)
8	(.06690974, .08172180)	(.0000000000, .0000000000)	.02640	(.2498539-019, .2045680-019)
9	(.03285602, .00039612)	(.0000000000, .0000000000)	.02700	(.5535187-020, .4591088-018)
10	(.00612502, -.00690448)	(.0000000000, .0000000000)	.03380	(.3110433-020, .2759292-020)
11	(-.00028227, -.00234476)	(.0000000000, .0000000000)	.02820	(.6817817-020, .8207601-021)
12	(-.00045317, -.00031988)	(.0000000000, .0000000000)	.02880	(.4141902-021, .5867864-021)
13	(-.00011761, .00002562)	(.0000000000, .0000000000)	.02920	(.1504652-021, .6907261-021)
14	(-.00001233, -.00002090)	(.0000000000, .0000000000)	.02980	(.1309357-021, .7723947-022)
15	(.00000129, .00000438)	(.0000000000, .0000000000)	.03020	(.1108308-021, .3255134-022)
16	(.00000072, .00000037)	(.0000000000, .0000000000)	.03680	(.1700819-022, .3345098-022)
17	(.00000013, -.00000004)	(.0000000000, .0000000000)	.03100	(.8051597-023, .2268162-022)
18	(.00000001, -.00000002)	(.0000000000, .0000000000)	.03160	(.9557274-023, .4278731-023)
19	(.00000000, .00000000)	(.0000000000, .0000000000)	.03180	(.5484841-023, .2225710-023)
20	(.00000000, .00000000)	(.0000000000, .0000000000)	.03220	(.1201466-023, .3000416-023)
21	(.00000000, .00000000)	(.0000000000, .0000000000)	.03260	(.6758926-024, .1506144-023)
22	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1021022-023, .3701348-024)
23	(.00000000, .00000000)	(.0000000000, .0000000000)	.03940	(.4581478-024, .2225000-024)
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.1234539-024, .3725729-024)
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.7856605-025, .1517507-024)
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.1445208-024, .4411634-025)
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.5404426-025, .2950359-025)

TABLE 9 FOR Z=1.50, 5.0

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-21.41287416, -1.3614108i)	(.000000000, .000000000)	.02280	(.3219888-012,	.5064382-011)	
2	(-1.87891399, -18.371175618)	(.000000000, .000000000)	.02320	(.6828262-012,	.6983392-013)	
3	(13.31260610, -5.23572606)	(.000000000, .000000000)	.02340	(.1703645-013,	.4331768-013)	
4	(6.72504201, 7.24275688)	(.000000000, .000000000)	.02380	(.5677836-014,	.5271982-014)	
5	(-2.13836698, 5.64989796)	(.000000000, .000000000)	.02460	(.2869643-014,	.1086099-014)	
6	(-3.21351103, .54550806)	(.000000000, .000000000)	.02520	(.2935334-015,	.1729164-014)	
7	(-1.06323659, -1.13907505)	(.000000000, .000000000)	.03220	(.1306927-015,	.1219913-015)	
8	(13027474, -65168191)	(.000000000, .000000000)	.02640	(.1508467-015,	.3015508-016)	
9	(.22898513, -111205559)	(.000000000, .000000000)	.02700	(.1166999-016,	.2384757-016)	
10	(.08019841, .03780861)	(.000000000, .000000000)	.02760	(.4363181-017,	.9255040-017)	
11	(.00702892, .02727598)	(.000000000, .000000000)	.02820	(.6286045-017,	.1619890-017)	
12	(-0.04472764, .00673493)	(.000000000, .000000000)	.02880	(.1139407-017,	.7998154-018)	
13	(-0.00221141, .00023418)	(.000000000, .000000000)	.02920	(.2870698-018,	.2710831-017)	
14	(-0.00041316, -0.00037639)	(.000000000, .000000000)	.03600	(.1752415-018,	.1923580-018)	
15	(.00000068, -0.00013124)	(.000000000, .000000000)	.03000	(.1176678-016,	.6095005-019)	
16	(.00002146, -0.0001938)	(.000000000, .000000000)	.03080	(.3993418-019,	.4421915-019)	
17	(.00000598, .00000055)	(.000000000, .000000000)	.03100	(.1491530-019,	.1624846-018)	
18	(.00000072, .00000093)	(.000000000, .000000000)	.03160	(.1252312-019,	.96688072-020)	
19	(-0.00000003, .00000022)	(.000000000, .000000000)	.03180	(.2527275-019,	.4097937-020)	
20	(-0.00000003, .00000002)	(.000000000, .000000000)	.03820	(.2643494-020,	.3906075-020)	
21	(-0.00000001, .00000000)	(.000000000, .000000000)	.03260	(.1240309-020,	.5614030-020)	
22	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1322677-020,	.7987969-021)	
23	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1503874-020,	.4076562-021)	
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.2625888-021,	.4808010-021)	
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1438784-021,	.4574495-021)	
26	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1859362-021,	.9279011-022)	
27	(.00000000, .00000000)	(.000000000, .000000000)	.03920	(.1532491-021,	.5404398-022)	

TABLE 10 FOR Z=(6.0, -4.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-5.25591113, -5.89332304)	(.0000000000, .0000000000)	.02280	(.2605860-011, .2324015-011)		
2	(-6.06656938, 3.64311620)	(.0000000000, .0000000000)	.02300	(.4284242-012, .7134182-012)		
3	(1.33499720, 5.70812456)	(.0000000000, .0000000000)	.02340	(.3509769-012, .8208531-013)		
4	(4.35627918, .92481489)	(.0000000000, .0000000000)	.02380	(.1846697-013, .8698742-013)		
5	(2.11706673, -2.17366209)	(.0000000000, .0000000000)	.03080	(.6227672-014, .6065523-014)		
6	(-.24146212, -1.80437365)	(.0000000000, .0000000000)	.02520	(.8559632-014, .1145454-014)		
7	(-.70582322, -5.4758954)	(.0000000000, .0000000000)	.02580	(.3951297-015, .5670344-015)		
8	(-.43823280, .07353477)	(.0000000000, .0000000000)	.02640	(.1021860-015, .6089806-015)		
9	(-.11372629, .14398259)	(.0000000000, .0000000000)	.02700	(.5460516-016, .4313050-016)		
10	(.00267153, .06803883)	(.0000000000, .0000000000)	.02760	(.3104146-015, .1218837-016)		
11	(.01521625, .01714013)	(.0000000000, .0000000000)	.02820	(.7017923-017, .6230199-017)		
12	(.00694794, .00122131)	(.0000000000, .0000000000)	.03480	(.1910881-017, .1087085-016)		
13	(.00176948, -.00093107)	(.0000000000, .0000000000)	.02920	(.9017669-018, .1713788-017)		
14	(.00022264, -.00047556)	(.0000000000, .0000000000)	.02960	(.8335620-018, .3902479-018)		
15	(-.00002587, -.00012583)	(.0000000000, .0000000000)	.03020	(.808723-018, .1661891-018)		
16	(-.00002184, -.00001970)	(.0000000000, .0000000000)	.03060	(.1045993-018, .1160010-018)		
17	(-.00000629, -.0000066)	(.0000000000, .0000000000)	.03100	(.3849810-019, .3658134-018)		
18	(-.00000111, .00000064)	(.0000000000, .0000000000)	.03760	(.22386999-019, .3914105-019)		
19	(-.00000010, .00000022)	(.0000000000, .0000000000)	.03180	(.2428817-019, .1115367-019)		
20	(-.00000001, .00000004)	(.0000000000, .0000000000)	.03220	(.2915193-019, .5515803-020)		
21	(.00000001, .00000001)	(.0000000000, .0000000000)	.03260	(.4126729-020, .4263869-020)		
22	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1678029-020, .1062114-019)		
23	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.1051319-020, .2156591-020)		
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1126837-020, .6284459-021)		
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03920	(.3310887-020, .3259027-021)		
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.3010955-021, .2554441-021)		
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1230104-021, .4567547-021)		

TABLE 11 FOR Z=(7.0, 3.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(.51305100, 2.80119635)	(.0000000001, .0000000000)	.02280	(.1804554-009,	.3305118-010)
2	(-2.49278593, .96906203)	(.000000003, -.000000001)	.02300	(.7443478-011,	.1914738-010)
3	(-1.51596930, -1.81762449)	(.000000001, .000000000)	.02340	(.2330368-011,	.1943617-011)
4	(.83092470, -1.81479963)	(.000000000, .000000000)	.02360	(.7709353-012,	.3529807-012)
5	(1.56728985, -.27842675)	(.000000000, -.000000000)	.02440	(.7074433-013,	.3982263-012)
6	(.91661818, .66810018)	(.000000000, .000000000)	.02500	(.2002667-013,	.2747613-013)
7	(.17490901, .67708470)	(.000000000, .000000000)	.02560	(.1665167-013,	.4301569-014)
8	(-.13077955, .34928124)	(.000000000, .000000000)	.02640	(.3392142-014,	.1270102-014)
9	(-.138388850, .10562076)	(.000000000, .000000000)	.03320	(.4694880-015,	.6151418-015)
10	(-.07152096, .00901523)	(.000000000, .000000000)	.02760	(.1281184-015,	.1016408-014)
11	(-.02492221, -.005987266)	(.000000000, .000000000)	.02820	(.5000162-016,	.1262224-015)
12	(-.005888622, -.006886908)	(.000000000, .000000000)	.02860	(.2779843-016,	.2382088-016)
13	(-.00065467, -.00271697)	(.000000000, .000000000)	.02900	(.3172490-016,	.7644257-017)
14	(.00017807, -.00077616)	(.000000000, .000000000)	.02960	(.1432647-016,	.3286951-017)
15	(.00013235, -.00016380)	(.000000000, .000000000)	.03020	(.2293802-017,	.1853314-017)
16	(.00004694, -.00002230)	(.000000000, .000000000)	.03680	(.7462984-018,	.1570859-017)
17	(.00001202, -.00000001)	(.000000000, .000000000)	.03100	(.3263421-018,	.3254629-015)
18	(.00000237, .00000111)	(.000000000, .000000000)	.03140	(.1799778-018,	.3850519-018)
19	(.00000035, .00000041)	(.000000000, .000000000)	.03160	(.1303086-018,	.1095108-018)
20	(.00000003, .00000010)	(.000000000, .000000000)	.03220	(.1675972-018,	.4588775-019)
21	(.00000000, .00000002)	(.000000000, .000000000)	.03240	(.1485826-018,	.2425533-019)
22	(.00000000, .00000000)	(.000000000, .000000000)	.03880	(.2384681-019,	.1592072-019)
23	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.8810223-020,	.1414018-019)
24	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.4343994-020,	.3223414-019)
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.2631837-020,	.8890182-020)
26	(.00000000, .00000000)	(.000000000, .000000000)	.03280	(.1980817-020,	.2312512-020)
27	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.2124561-020,	.1008477-020)

TABLE 12 FOR Z=(6.0, -6.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-32.06801399, -42.90433829)	(.0000000003, -.0000000052)	.02280	(.1269952-009,	.9492008-010)	
2	(-41.34637965, 22.91969086)	(-.0000000007, -.0000000180)	.02320	(.2199401-010,	.3967649-010)	
3	(10.64599049, 36.76210869)	(-.0000000029, -.0000000027)	.02360	(.1812016-010,	.5247444-011)	
4	(28.28832055, .78435873)	(-.000000008, -.000000000)	.02380	(.1377711-011,	.4968788-010)	
5	(7.68998406, -17.38032251)	(-.000000001, .000000001)	.02440	(.9773572-012,	.4324351-012)	
6	(-7.39639841, -8.85964077)	(.000000000, .000000000)	.02520	(.1874420-012,	.1564844-012)	
7	(-6.22674169, 1.12428332)	(.000000000, .000000000)	.03200	(.3935966-013,	.2179899-012)	
8	(-1.17979744, 2.90677267)	(.000000000, .000000000)	.02640	(.3525340-013,	.1430861-013)	
9	(.77798154, 1.17835032)	(.000000000, .000000000)	.02700	(.8723726-014,	.5759661-014)	
10	(.57924428, .02772512)	(.000000000, .000000000)	.02780	(.1841120-014,	.3846541-013)	
11	(.14121706, -.16673465)	(.000000000, .000000000)	.02800	(.1144287-014,	.9691615-015)	
12	(-.01466615, -.07450738)	(.000000000, .000000000)	.02880	(.1611922-014,	.3172934-015)	
13	(-.02153459, -.01161241)	(.000000000, .000000000)	.02920	(.1552525-015,	.2879075-015)	
14	(-.00683191, .00268887)	(.000000000, .000000000)	.03580	(.6697418-016,	.1701688-015)	
15	(-.00068057, .00194531)	(.000000000, .000000000)	.03000	(.8913774-016,	.3118513-016)	
16	(.00026721, .00047297)	(.000000000, .000000000)	.03050	(.2918797-016,	.1649019-016)	
17	(.00013188, .00002851)	(.000000000, .000000000)	.03120	(.7379407-017,	.3414209-016)	
18	(.00002570, -.00001853)	(.000000000, .000000000)	.03140	(.4590936-017,	.6366303-017)	
19	(.00000080, -.00000701)	(.000000000, .000000000)	.03180	(.1739815-016,	.1984210-017)	
20	(-.00000098, -.00000113)	(.000000000, .000000000)	.03840	(.1630552-017,	.1414254-017)	
21	(-.00000030, -.0000001)	(.000000000, .000000000)	.03260	(.5919830-018,	.1842109-016)	
22	(-.00000004, .00000064)	(.000000000, .000000000)	.03280	(.4744373-018,	.4712974-018)	
23	(.00000000, .00000001)	(.000000000, .000000000)	.03320	(.5375142-017,	.1926710-018)	
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1500647-018,	.11712202-018)	
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.6754278-019,	.7211888-018)	
26	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.6583848-019,	.5177867-019)	
27	(.00000000, .00000000)	(.000000000, .000000000)	.03920	(.1757008-018,	.2525202-019)	

TABLE 13 FOR Z=(8.0, -2.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(.92107273, -45000975)	(.0000000024, .000000003)	.02280	(.16261120-008, .33283177-008)		
2	(-.29203216, -.92552471)	(.0000000062, .000000006)	.02300	(.1112978-008, .3511797-008)		
3	(-.94961437, -.01988801)	(.0000000013, -.000000002)	.02320	(.7056099-010, .3369151-008)		
4	(-.37477421, .74390710)	(.000000003, -.000000001)	.02380	(.3510325-010, .1768473-010)		
5	(.42184873, .63185371)	(.000000001, .000000000)	.03060	(.5844699-011, .3902135-011)		
6	(.68522751, .12352336)	(.000000001, .000000000)	.02520	(.6450312-012, .3578215-011)		
7	(.50193481, -.21562279)	(.000000001, .000000000)	.02580	(.15128800-012, .3521551-012)		
8	(.23027450, -.27198774)	(.000000001, .000000000)	.02640	(.54388352-013, .4604302-013)		
9	(.05951730, -.18798965)	(.000000001, .000000000)	.02700	(.3336730-013, .1056405-013)		
10	(-.00471393, -.09459885)	(.000000001, .000000000)	.02740	(.6433419-013, .3205820-014)		
11	(-.01496252, -.03736876)	(.000000001, .000000000)	.03420	(.2984604-014, .1195041-014)		
12	(-.00983280, -.01180194)	(.000000001, .000000000)	.02840	(.6457145-015, .5379779-015)		
13	(-.00446991, -.00289516)	(.000000001, .000000000)	.02900	(.1952192-015, .3014035-015)		
14	(-.00162591, -.00047201)	(.000000001, .000000000)	.02960	(.7138184-016, .2458835-015)		
15	(-.00049731, .00000131)	(.000000001, .000000000)	.03000	(.3006990-016, .1141160-013)		
16	(-.00013046, .00003784)	(.000000001, .000000000)	.03040	(.1432201-016, .4938095-016)		
17	(-.00002943, .00001835)	(.000000001, .000000000)	.03080	(.7698526-017, .1234750-016)		
18	(-.00000562, .00000613)	(.000000001, .000000000)	.03740	(.4750889-017, .4352501-017)		
19	(-.00000086, .00000167)	(.000000001, .000000000)	.03180	(.3568359-017, .1826194-017)		
20	(-.0000008, .00000039)	(.000000001, .000000000)	.03200	(.4122682-017, .8652609-018)		
21	(.0000000, .0000008)	(.000000001, .000000000)	.03260	(.7921238-017, .4532785-018)		
22	(.0000000, .0000001)	(.000000001, .000000000)	.03280	(.7885538-018, .2607882-018)		
23	(.0000000, .0000000)	(.000000001, .000000000)	.03300	(.2526031-018, .1655241-018)		
24	(.0000000, .0000000)	(.000000001, .000000000)	.03280	(.1061359-018, .1182668-018)		
25	(.0000000, .0000000)	(.000000001, .000000000)	.03390	(.5159085-019, .1007536-018)		
26	(.0000000, .0000000)	(.000000001, .000000000)	.03280	(.2781337-019, .1266800-018)		
27	(.0000000, .0000000)	(.000000001, .000000000)	.03300	(.1634922-019, .4078016-018)		

TABLE 14 FOR Z=(7.0, 7.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(46.79823538, 127.04731350)	(-0.0000001841, -0.0000018205)	0.02280	(.19176422-007, .77063687-008)	
2	(-108.57072848, 54.86120542)	(-0.0000003341, -0.0000063006)	0.02320	(.21533345-008, .4261486-008)	
3	(-62.14381335, -80.35247520)	(-0.0000011987, -0.0000010924)	0.02360	(.9310683-009, .7200790-009)	
4	(47.500889053, -62.66491763)	(-0.0000003949, -0.0000000162)	0.02380	(.2871054-009, .2176300-009)	
5	(53.47865501, 17.40058483)	(-0.0000000624, -0.0000000671)	0.02440	(.5737505-010, .1763355-009)	
6	(3.12713792, 36.89486750)	(-0.00000007, -0.0000000202)	0.02520	(.2111600-009, .1789752-010)	
7	(-19.17407892, 11.54318338)	(-0.000000031, -0.0000000629)	0.02600	(.7102578-011, .1179791-010)	
8	(-10.75803347, -6.17760520)	(-0.00000009, -0.000000000)	0.02660	(.2506344-011, .4364690-011)	
9	(-1.18093669, -6.30840822)	(-0.00000001, -0.000000001)	0.03340	(.2836982-010, .8136984-012)	
10	(2.41459002, -1.70057248)	(-0.00000000, -0.00000000)	0.02760	(.3897258-012, .55333595-012)	
11	(1.20096174, .42960464)	(-0.00000000, -0.00000000)	0.02820	(.1385155-012, .3872207-012)	
12	(.14772859, .48843990)	(-0.00000000, -0.00000000)	0.02860	(.1921976-012, .5813015-013)	
13	(-1.11038719, .15447189)	(-0.00000000, -0.00000000)	0.02900	(.4243808-013, .3032668-013)	
14	(-.06585700, .00344124)	(-0.00000000, -0.00000000)	0.02980	(.1135779-013, .2173604-012)	
15	(-.01444432, -.01587541)	(-0.00000000, -0.00000000)	0.03020	(.8009986-014, .7287923-014)	
16	(.00088614, -.00650787)	(-0.00000000, -0.00000000)	0.03680	(.1958366-013, .26666606-014)	
17	(.00159465, -.00102519)	(-0.00000000, -0.00000000)	0.03100	(.1584294-014, .2464312-014)	
18	(.00049683, .00014538)	(-0.00000000, -0.00000000)	0.03140	(.7191383-015, .2457531-014)	
19	(.00005675, .00012149)	(-0.00000000, -0.00000000)	0.03180	(.8656870-015, .4043593-015)	
20	(-.00001305, .00003034)	(-0.00000000, -0.00000000)	0.03220	(.50356884-015, .2165962-015)	
21	(-.000000734, .00000249)	(-0.00000000, -0.00000000)	0.03260	(.1165505-015, .3440987-015)	
22	(-.00000152, -.00000084)	(-0.00000000, -0.00000000)	0.03900	(.7146286-016, .1286895-015)	
23	(-.00000009, -.00000036)	(-0.00000000, -0.00000000)	0.03320	(.1551326-015, .3703590-016)	
24	(.00000004, -.00000006)	(-0.00000000, -0.00000000)	0.03320	(.3789553-016, .2546579-016)	
25	(.00000001, .00000001)	(-0.00000000, -0.00000000)	0.03300	(.1276205-016, .8105061-016)	
26	(.00000000, .00000000)	(-0.00000000, -0.00000000)	0.03300	(.9695893-017, .1239037-016)	
27	(.00000000, .00000000)	(-0.00000000, -0.00000000)	0.03300	(.5274267-016, .4711326-017)	

TABLE 15 FOR Z=1 9.0, 1.0

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(.36877896, -14213813)	(.0000000417, .0000000753)	.02280	(.1075269-006, .2789796-006)	
2	(.23264074, .24507589)	(.0000001062, .0000001953)	.02320	(.4061819-007, .3855723-007)	
3	(-.25468902, .23838409)	(.0000000197, .0000000481)	.02340	(.8399300-008, .8973792-008)	
4	(-.38292004, -.06945546)	(.000000032, .0000000177)	.02400	(.1204489-008, .6640558-008)	
5	(-.08830960, -.26201132)	(.000000004, .000000024)	.02460	(.1074873-008, .3622806-009)	
6	(.25404227, -.20734848)	(.000000000, .000000005)	.02520	(.7355434-010, .9011839-010)	
7	(.39255817, -.04825872)	(.000000000, .000000001)	.03180	(.8979992-011, .7304731-010)	
8	(.34091759, .06617272)	(.000000000, .000000000)	.02660	(.1872697-011, .9648014-011)	
9	(.21903812, .09794396)	(.000000000, .000000000)	.02720	(.5075756-012, .1135123-011)	
10	(.11331615, .07924479)	(.000000000, .000000000)	.02760	(.1645288-012, .2352680-012)	
11	(.04903264, .04836993)	(.000000000, .000000000)	.02820	(.6148473-013, .6232713-013)	
12	(.01805704, .02439579)	(.000000000, .000000000)	.02880	(.2606663-013, .1929375-013)	
13	(.00567248, .01060717)	(.000000000, .000000000)	.02920	(.1252318-013, .6697113-014)	
14	(.00149352, .00407486)	(.000000000, .000000000)	.03580	(.6946921-014, .2546184-014)	
15	(.00030877, .00140559)	(.000000000, .000000000)	.03020	(.4754367-014, .1044412-014)	
16	(.00003741, .00044033)	(.000000000, .000000000)	.03060	(.5384293-014, .4574215-015)	
17	(-.00000555, .00012633)	(.000000000, .000000000)	.03080	(.4830982-014, .2123152-015)	
18	(-.00000575, .00003340)	(.000000000, .000000000)	.03140	(.6035028-015, .1038716-015)	
19	(-.00000248, .00000818)	(.000000000, .000000000)	.03180	(.1756386-015, .5335233-016)	
20	(-.00000083, .00000186)	(.000000000, .000000000)	.03840	(.6460852-016, .2869361-016)	
21	(-.00000024, .00000039)	(.000000000, .000000000)	.03260	(.2693239-016, .1613361-016)	
22	(-.00000006, .00000008)	(.000000000, .000000000)	.03280	(.1220651-016, .9481234-017)	
23	(-.00000001, .00000001)	(.000000000, .000000000)	.03300	(.5892149-017, .5830552-017)	
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.2992897-017, .3784496-017)	
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1587362-017, .2569093-017)	
26	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.8743930-018, .1877670-017)	
27	(.00000000, .00000000)	(.000000000, .000000000)	.03900	(.4983292-018, .1510244-017)	

TABLE 16 FOR Z=(8.0, -8.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(336.94890641, -75.95002010)	(-0.0000680669, -0.0002975568)	.02280	(.2852010-006, .1265282-005)
2	(-38.27182079, -312.17128893)	(-.0000697569, -.0010071152)	.02320	(.7475794-006, .9165233-007)
3	(-268.47403366, -11.66076305)	(-.0002219538, -.0001965876)	.02360	(.3014249-007, .6939921-006)
4	(-58.03315569, 207.12073798)	(-.0000824400, .0000044115)	.02380	(.3756306-007, .1052479-007)
5	(135.89708642, -86.20455380)	(-.0000147050, .0000161755)	.03080	(.4124576-008, .6502184-008)
6	(89.09098844, -68.30721285)	(.0000002353, .0000055144)	.02520	(.1547401-008, .2018227-008)
7	(-17.84843547, -70.61672208)	(.0000009773, .0000009049)	.02580	(.1820540-008, .4601430-009)
8	(-42.91873767, -9.09980009)	(.0000003077, -.0000000107)	.02640	(.1713122-009, .8079854-009)
9	(-15.97050219, 18.59818441)	(-.0000000467, -.0000000498)	.02700	(.1001656-009, .8601346-010)
10	(4.02896524, 12.05594250)	(-.000000004, -.0000000146)	.02760.	(.8318685-010, .2780014-010)
11	(5.93678062, 1.50795027)	(-.000000022, -.0000000021)	.03440	(.1140550-010, .4490329-010)
12	(2.06067650, -1.81943752)	(-.000000006, .000000000)	.02860	(.6409621-011, .7259472-011)
13	(-11660959, -1.14609181)	(-.000000001, .000000001)	.02900	(.2135805-010, .2173084-011)
14	(-38776790, -.23245224)	(.000000000, .000000000)	.02960	(.1172026-011, .1955129-011)
15	(-15519281, .06070657)	(.000000000, .000000000)	.03020	(.5176815-012, .11323423-011)
16	(-01704343, .05529054)	(.000000000, .000000000)	.03060	(.8080500-012, .2490832-012)
17	(-.01052486, .01578765)	(.000000000, .000000000)	.03100	(.2177082-012, .1451355-012)
18	(.00586001, .00062356)	(.000000000, .000000000)	.03760	(.6319752-013, .5939137-012)
19	(.00125715, -.00119963)	(.000000000, .000000000)	.03180	(.4628945-013, .4850897-013)
20	(-.00002514, -.00048694)	(.000000000, .000000000)	.03220	(.3539688-012, .1827115-013)
21	(-.00010264, -.00008056)	(.000000000, .000000000)	.03260	(.1290446-013, .1644034-013)
22	(-.00003281, .00000605)	(.000000000, .000000000)	.03300	(.5855269-014, .3173569-013)
23	(-.00000424, .00000698)	(.000000000, .000000000)	.03320	(.6411029-014, .3891299-014)
24	(.00000055, .00000184)	(.000000000, .000000000)	.03920	(.6773957-014, .2041893-014)
25	(.00000039, .0000019)	(.000000000, .000000000)	.03320	(.1292889-014, .2719831-014)
26	(.00000009, -.00000004)	(.000000000, .000000000)	.03300	(.7646560-015, .1876381-014)
27	(.00000001, -.00000002)	(.000000000, .000000001)	.03300	(.1248838-014, .4648287-015)

TABLE 17 FOR Z=(9.0, 9.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(633.81320074, -621.22017556)	(-.06916174383,	.0270374154)	.02280	(.9356040-005,	.9545761-005)
2	(620.63016019, 530.64875963)	(-.0077508972,	.0864860869)	.02320	(.3200327-005,	.3743003-005)
3	(-377.97299388, 601.22475567)	(-.0222716973,	.0190984212)	.02360	(.1672107-005,	.1051206-005)
4	(-546.21290626, -204.24931825)	(-.0091672422,	-.0006208584)	.02380	(.3506478-006,	.9377183-006)
5	(44.43418825, -449.24089960)	(-.0018151484,	-.0020479703)	.02460	(.1246868-005,	.1233271-006)
6	(321.32027351, -70.01461944)	(.0000419079,	-.0007760730)	.02520	(.4770890-007,	.2189519-006)
7	(123.10291158, 188.35096809)	(.0001562593,	-.0001417527)	.02600	(.3302064-007,	.2158171-007)
8	(-79.07836710, 120.76310681)	(.0000548027,	.0000024178)	.02660	(.1308530-007,	.8568544-008)
9	(-86.04980944, -10.71410258)	(.0000092825,	.0000100596)	.03300	(.2943375-008,	.2363957-007)
10	(-17.68554486, -45.42739995)	(-.0000001206,	.00000032813)	.02760	(.3375521-008,	.1314139-008)
11	(15.92431522, -20.11018084)	(-.0000005540,	.0000005179)	.02800	(.8520556-009,	.6747031-009)
12	(12.56948688, 1.38523810)	(-.0000001688,	-.0000000053)	.02880	(.2368867-009,	.2149482-008)
13	(2.68198475, 5.19784914)	(-.0000000249,	-.0000000264)	.02920	(.2355093-009,	.1215180-009)
14	(-1.18750459, 2.24878824)	(.000000002,	-.0000000075)	.02980	(.1091930-009,	.5766094-010)
15	(-1.0310906, 14749527)	(.000000011,	-.0000000010)	.03020	(.2500964-010,	.1748355-009)
16	(-28516841, -28446436)	(.000000033,	.000000000)	.03620	(.17438694-010,	.1748210-010)
17	(-.01841858, -14624363)	(.000000000,	.000000000)	.03100	(.5053750-010,	.6364921-011)
18	(-.04372109, -02656427)	(.000000000,	.000000000)	.03160	(.3871137-011,	.6371352-011)
19	(.01589505, .00567293)	(.000000000,	.000000000)	.03180	(.1882316-011,	.5274088-011)
20	(-.00181131, .00498423)	(.000000000,	.000000000)	.03240	(.2841113-011,	.1032482-011)
21	(-.00079386, .00137801)	(.000000000,	.000000000)	.03260	(.1085621-011,	.6254187-012)
22	(-.00044829, .00008348)	(.000000000,	.000000000)	.03920	(.3137089-012,	.1684537-011)
23	(-.00009789, -.00007812)	(.000000000,	.000000000)	.03320	(.2285790-012,	.2864255-012)
24	(-.0000149, -.00003296)	(.000000000,	.000000000)	.03320	(.2328190-011,	.1053556-012)
25	(.0000600, -.0000581)	(.000000000,	.000000000)	.03300	(.8765441-013,	.9057725-013)
26	(.0000203, .0000015)	(.000000000,	.000000000)	.03300	(.3836873-013,	.5208070-012)
27	(.00000029, .0000038)	(.000000000,	.000000000)	.03300	(.3851584-013,	.2981417-013)

TABLE 18 FOR Z=(10.0, -1.0)

N	JN	BESL.	EQ.	TIME	TIME	REL. ERROR
1	(.05220533, .29346758)	(.0000035026, -.0000027811)	.02280	(.2913733-004, .5183278-005)		
2	(.386222972, .01272424)	(.0000093286, -.0000071817)	.02320	(.1041588-005, .3161621-004)		
3	(.10025309, -.27313210)	(.0000022248, -.00000020915)	.02360	(.1008195-005, .3700579-006)		
4	(-.31044774, -.16902532)	(.00000004943, -.00000005662)	.02380	(.7790500-007, .1430876-006)		
5	(-.33276414, .11466073)	(.00000001021, -.0000001434)	.02460	(.1660066-007, .4817782-007)		
6	(-.03037425, .24960385)	(.0000000195, -.0000000342)	.02520	(.3973371-007, .4835189-008)		
7	(.26702002, .17828948)	(.0000000034, -.0000000077)	.03200	(.9463250-009, .1417289-008)		
8	(.37578762, .03454275)	(.0000000005, -.0000000016)	.02640	(.1351551-009, .1470340-008)		
9	(.32281498, -.06403757)	(.0000000001, -.0000000003)	.02700	(.3040735-010, .1532842-009)		
10	(.21093884, -.09113774)	(.0000000000, -.0000000001)	.02760	(.8660492-011, .2004476-010)		
11	(.11293277, -.07466313)	(.0000000000, .0000000000)	.02820	(.2903032-011, .4391021-011)		
12	(.05131660, -.04689561)	(.0000000000, .0000000000)	.02860	(.1106997-011, .1211357-011)		
13	(.02015117, -.02457794)	(.0000000000, .0000000000)	.03540	(.4721866-012, .3871404-012)		
14	(.00688469, -.01118689)	(.0000000000, .0000000000)	.02980	(.2240260-012, .1378712-012)		
15	(.00203642, -.00452661)	(.0000000000, .0000000000)	.03020	(.1189314-012, .5350456-013)		
16	(.00050861, -.00165360)	(.0000000000, .0000000000)	.03040	(.7250890-013, .2230235-013)		
17	(.00009895, -.00055137)	(.0000000000, .0000000000)	.03100	(.5508482-013, .9885308-014)		
18	(.00001008, -.00016919)	(.0000000000, .0000000000)	.03140	(.7762020-013, .4625209-014)		
19	(-.00000271, -.00004808)	(.0000000000, .0000000000)	.03200	(.4031889-013, .2271927-014)		
20	(-.00000219, -.00001271)	(.0000000000, .0000000000)	.03820	(.6786503-014, .1166755-014)		
21	(-.00000091, -.00000314)	(.0000000000, .0000000000)	.03260	(.2149929-014, .6245094-015)		
22	(-.00000030, -.00000073)	(.0000000000, .0000000000)	.03280	(.8364933-015, .3476168-015)		
23	(-.00000009, -.00000016)	(.0000000000, .0000000000)	.03320	(.3644102-015, .2009337-015)		
24	(-.00000002, -.00000003)	(.0000000000, .0000000000)	.03320	(.1713544-015, .1205379-015)		
25	(-.00000001, -.00000001)	(.0000000000, .0000000000)	.03300	(.8535989-016, .7506864-016)		
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.4455163-016, .4860987-016)		
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.2418791-016, .3283560-016)		

TABLE 19 FOR Z=(9.0, 2.0)

N	JN	BESL.	EQ.	TIME	REL.	ERRDR
1	(.85864274, -46597136)	(-.0000000747, -.0000001499)	.02260	(.8660826-007, .1595925-006)		
2	(.59298100, .71707782)	(.0000002006, -.00000003909)	.02300	(.3042684-007, .2516120-007)		
3	(-.54000817, .71386493)	(.0000000667, -.00000000807)	.02340	(.7700995-008, .5825472-008)		
4	(-.83526408, -.18732718)	(.0000000186, -.0000000146)	.02380	(.1092908-008, .4873113-008)		
5	(-.20277123, -.71531589)	(.0000000046, -.0000000022)	.03060	(.9433172-009, .2674030-009)		
6	(.45225551, -52235523)	(.0000000010, -.0000000002)	.02500	(.8476799-010, .73339218-010)		
7	(.62991323, -.07607820)	(.000000002, .000000000)	.02580	(.1168970-010, .9678850-010)		
8	(.45643716, .20207966)	(.000000000, .000000000)	.02660	(.2974695-011, .6718941-011)		
9	(.21942208, .24658976)	(.000000000, .000000000)	.02700	(.1097108-011, .9762353-012)		
10	(.06619351, .17495970)	(.000000000, .000000000)	.02760	(.6209117-012, .2349131-012)		
11	(.00308640, .09276324)	(.000000000, .000000000)	.02800	(.2192376-011, .7294420-013)		
12	(-.01098541, .03952643)	(.000000000, .000000000)	.02840	(.9791112-013, .2721201-013)		
13	(-.00868145, .01388391)	(.000000000, .000000000)	.02920	(.1903769-013, .1190405-013)		
14	(-.00442042, .00400616)	(.000000000, .000000000)	.02940	(.55598117-014, .6134736-014)		
15	(-.00178445, .00090545)	(.000000000, .000000000)	.03000	(.1984035-014, .3910094-014)		
16	(-.00060869, .00012960)	(.000000000, .000000000)	.03040	(.8125036-015, .3816041-014)		
17	(-.00018034, -.00000803)	(.000000000, .000000000)	.03100	(.3718097-015, .8347956-014)		
18	(-.00004697, -.00001424)	(.000000000, .000000000)	.03760	(.1880096-015, .6200836-015)		
19	(-.00001077, -.00000647)	(.000000000, .000000000)	.03180	(.1049770-015, .1748676-015)		
20	(-.00000215, -.00000215)	(.000000000, .000000000)	.03200	(.6546671-016, .6566027-016)		
21	(-.00000036, -.00000060)	(.000000000, .000000000)	.03240	(.4722109-016, .2870075-016)		
22	(-.00000005, -.00000014)	(.000000000, .000000000)	.03280	(.4392606-016, .1395126-016)		
23	(.0000000, -.00000003)	(.000000000, .000000000)	.03300	(.1042761-015, .7391845-017)		
24	(.0000000, -.00000001)	(.000000000, .000000000)	.03920	(.2550877-016, .4231982-017)		
25	(.0000000, .0000000)	(.000000000, .000000000)	.03300	(.6215591-017, .2614708-017)		
26	(.0000000, .0000000)	(.000000000, .000000000)	.03300	(.2402046-017, .1754221-017)		
27	(.0000000, .0000000)	(.000000000, .000000000)	.03280	(.1115230-017, .1301403-017)		

TABLE 20 FOR Z=(8.0, -3.0)

N	JN	BESL.	EQ.	TIME	TIME	REL.	ERROR
1	(2.47792513, -1.09173697)	(-0.0000000044, .0000000077)	.02280	(.2092197-008,	.4748677-008)		
2	(-62942479, -2.48071242)	(-.0000000111, .0000000214)	.02320	(.1851930-008,	.4698855-009)		
3	(-2.34604903, -.09916570)	(-.0000000007, .0000000053)	.02360	(.1061287-009,	.2510779-008)		
4	(-.88873098, 1.83702974)	(-.0000000003, .0000000011)	.02400	(.5699172-010,	.2757185-010)		
5	(96293264, 1.41752679)	(.0000000001, .000000002)	.02460	(.1021398-010,	.6938404-011)		
6	(1.36145437, .11215002)	(.0000000000, .0000000000)	.02520	(.1341811-011,	.1628992-010)		
7	(.772116624, -.59863968)	(.0000000000, .0000000000)	.02600	(.4211180-012,	.5431867-012)		
8	(.16766188, -.58635087)	(.0000000000, .0000000000)	.02660	(.3314147-012,	.9476511-013)		
9	(-.09263800, -.31923897)	(.0000000000, .0000000000)	.02700	(.9855417-013,	.2859883-013)		
10	(-.11425047, -.11190753)	(.0000000000, .0000000000)	.02760	(.1264369-013,	.1290840-013)		
11	(-.06579520, -.01994230)	(.0000000000, .0000000000)	.02820	(.3349739-014,	.1105172-013)		
12	(-.02634903, .00434139)	(.0000000000, .0000000000)	.02880	(.1232180-014,	.7478418-014)		
13	(-.00778828, .00537267)	(.0000000000, .0000000000)	.02920	(.5936186-015,	.8605155-015)		
14	(-.00158288, .00264532)	(.0000000000, .0000000000)	.02960	(.4025032-015,	.2408468-015)		
15	(-.000111272, .00092307)	(.0000000000, .0000000000)	.03000	(.7545632-015,	.9214398-016)		
16	(.00007427, .00025045)	(.0000000000, .0000000000)	.03060	(.1482571-015,	.4396367-016)		
17	(.00004381, .00005290)	(.0000000000, .0000000000)	.03100	(.3158105-016,	.2615430-016)		
18	(.00001505, .00000785)	(.0000000000, .0000000000)	.03140	(.1122173-016,	.2150526-016)		
19	(.00000394, .00000034)	(.0000000000, .0000000000)	.03180	(.5082218-017,	.5818837-016)		
20	(.00000083, -.00000026)	(.0000000000, .0000000000)	.03220	(.2774467-017,	.8872933-017)		
21	(.00000014, -.00000012)	(.0000000000, .0000000000)	.03260	(.1841657-017,	.2230784-017)		
22	(.00000002, -.00000003)	(.0000000000, .0000000000)	.03280	(.1637287-017,	.8864632-018)		
23	(.00000000, .00000001)	(.0000000000, .0000000000)	.03300	(.3839669-017,	.4400058-018)		
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.9510888-018,	.2591789-018)		
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.2425496-018,	.1822715-018)		
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1013003-018,	.1654169-018)		
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.5284884-019,	.3006986-018)		

TABLE 21 FOR Z=(8.0, . 4.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(6.68116926, 2.57549712)	(-.0000000162, .0000000457)	.02260	(.38526680-008, .9994345-008)
2	(-1.39912668, 6.53156461)	(-.0000000499, .0000001274)	.02300	(.4330318-008, .9275975-009)
3	(-5.93450701, .31695407)	(-.0000000234, .00000000213)	.02320	(.2282849-009, .4274305-008)
4	(-2.06649131, -4.56104007)	(-.000000067, .000000019)	.02360	(.1396124-009, .6325162-010)
5	(2.45689794, -3.13918959)	(-.000000014, -.000000003)	.02440	(.2387056-010, .1868238-010)
6	(2.95379445, .19340150)	(-.000000002, -.000000002)	.02500	(.3860617-011, .5896267-010)
7	(1.20369630, 1.59899473)	(.000000006, .000000000)	.03200	(.1765321-011, .1328904-011)
8	(-.14932332, 1.20260370)	(.000000000, .000000000)	.02640	(.25455588-011, .3160772-012)
9	(-.48053065, .44462985)	(.000000000, .000000000)	.02680	(.1360618-012, .1470479-012)
10	(-.31546498, .03020761)	(.000000000, .000000000)	.02760	(.3432871-013, .3585025-012)
11	(-.12019170, -.06874965)	(.000000000, .000000000)	.02780	(.1439100-013, .2515910-013)
12	(-.02458138, -.04924596)	(.000000000, .000000000)	.02840	(.1085116-013, .5416415-014)
13	(.00210124, -.01994301)	(.000000000, .000000000)	.03500	(.1892347-013, .1993819-014)
14	(.00411869, -.005333747)	(.000000000, .000000000)	.02960	(.1392742-014, .1074777-014)
15	(.00195863, -.00076807)	(.000000000, .000000000)	.03020	(.4092994-015, .1043742-014)
16	(.00060511, .00009530)	(.000000000, .000000000)	.03040	(.1795406-015, .1139964-014)
17	(.00013020, .00010487)	(.000000000, .000000000)	.03080	(.1097581-015, .1362684-015)
18	(.00001583, .00003991)	(.000000000, .000000000)	.03140	(.1153545-015, .4574873-016)
19	(-.000000137, .00001032)	(.000000000, .000000000)	.03180	(.1654359-015, .2197095-016)
20	(-.000000142, .00000192)	(.000000000, .000000000)	.03820	(.1926093-016, .1424888-016)
21	(-.000000047, .00000022)	(.000000000, .000000000)	.03260	(.6801810-017, .1471515-016)
22	(-.000000011, -.000000011)	(.000000000, .000000000)	.03260	(.3411025-017, .5283898-016)
23	(-.000000002, -.00000001)	(.000000000, .000000000)	.03300	(.2260423-017, .3614024-017)
24	(.000000000, .00000000)	(.000000000, .000000000)	.03300	(.2214227-017, .1267789-017)
25	(.000000000, .00000000)	(.000000000, .000000000)	.03280	(.2114927-016, .6435027-018)
26	(.000000000, .00000000)	(.000000000, .000000000)	.03920	(.8665028-018, .4262433-018)
27	(.000000000, .00000000)	(.000000000, .000000000)	.03300	(.2855340-018, .3933916-018)

TABLE 22 FOR Z=(8.0, -5.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-17.91076563, -6.02381185)	(.0000002598,	.0000002331)	.02280	(.9284352-008,	.2760542-007)
2	(-3.15625591, -17.14816892)	(.0000007750,	.0000006825)	.02320	(.1307992-007,	.2407462-008)
3	(-15.19207611, -.85109290)	(.0000002488,	.0000000423)	.02380	(.6409069-009,	.1144024-007)
4	(-4.75033917, 11.56822732)	(.0000000542,	-.0000000220)	.02380	(.4603978-009,	.1890563-009)
5	(6.57690059, 7.03483427)	(.0000000076,	-.0000000104)	.03060	(.7129826-010,	.6665709-010)
6	(6.71000583, -1.54989282)	(.0000000002,	-.0000000027)	.02520	(.1433225-010,	.6204913-010)
7	(1.70573008, -4.18302933)	(-.0000000033,	-.0000000005)	.02600	(.1108105-010,	.4518562-011)
8	(-1.27344604, -2.37255864)	(-.0000000001,	-.0000000001)	.02640	(.2800500-011,	.1503139-011)
9	(-1.40456605, -.37386043)	(.0000000000,	.0000000000)	.02720	(.4606442-012,	.1730606-011)
10	(-.62104915, .34731317)	(.0000000000,	.0000000000)	.02760	(.1820049-012,	.3254526-012)
11	(-.10216633, .30043564)	(.0000000000,	.0000000000)	.03440	(.1863838-012,	.6338180-013)
12	(.04768742, .12053375)	(.0000000000,	.0000000000)	.02880	(.6495000-013,	.2569652-013)
13	(.04252514, .02388988)	(.0000000000,	.0000000000)	.02920	(.1145199-013,	.2038510-013)
14	(.01680186, -.00258585)	(.0000000000,	.0000000000)	.02980	(.4410348-014,	.2865674-013)
15	(.00383030, -.00396820)	(.0000000000,	.0000000000)	.03020	(.2851752-014,	.2752655-014)
16	(.00021503, -.00165934)	(.0000000000,	.0000000000)	.03040	(.7261068-014,	.9409379-015)
17	(-.00022871, -.00041817)	(.0000000000,	.0000000000)	.03100	(.9470865-015,	.5180052-015)
18	(-.00011528, -.00005552)	(.0000000000,	.0000000000)	.03780	(.2532442-015,	.5258223-015)
19	(-.000003203, .00000537)	(.0000000000,	.0000000000)	.03180	(.1194242-015,	.7128171-015)
20	(-.00000558, .00000547)	(.0000000000,	.0000000000)	.03240	(.8733595-016,	.8913755-016)
21	(-.00000034, .00000176)	(.0000000000,	.0000000000)	.03260	(.1780025-015,	.3446206-016)
22	(.00000016, .00000046)	(.0000000000,	.0000000000)	.03300	(.4716973-016,	.2044359-016)
23	(.00000007, .00000004)	(.0000000000,	.0000000000)	.03320	(.1256880-016,	.1981619-016)
24	(.00000002, .00000000)	(.0000000000,	.0000000000)	.03900	(.6123554-017,	.2171418-015)
25	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03320	(.4411507-017,	.6194498-017)
26	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03300	(.6028485-017,	.2295047-017)
27	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03300	(.5899470-017,	.1333187-017)

TABLE 23 FQR Z=(6.0, 8.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-200.05811087, 305.03937839)	(.0000015543, .0000016885)	.02260	(.6388287-008, .4189717-008)		
2	(-285.90905925, -149.98342054)	(.0000067824, .0000060991)	.02300	(.1176330-008, .2242404-008)		
3	(83.44524216, -249.54450038)	(-0.000001949, .0000023650)	.02320	(.1007617-008, .3369372-009)		
4	(196.16798626, 20.09368418)	(-0.0000004936, .0000003141)	.02360	(.1020515-009, .9962955-009)		
5	(-23.57534912, -133.64195759)	(-.0000001285, -.0000000478)	.02440	(.1929909-009, .3404491-010)		
6	(-75.10921072, 41.23121108)	(-0.000000088, -0.000000293)	.02500	(.1316873-010, .2398894-010)		
7	(-38.07201820, -31.85064332)	(.000000039, -0.000000053)	.02580	(.5412403-011, .6469605-011)		
8	(-7.45599491, -25.34509108)	(.000000013, .000000000)	.02640	(.5527394-011, .1626043-011)		
9	(12.78805673, -2.02431760)	(.00000002, .000000002)	.03300	(.6197522-012, .3915110-011)		
10	(3.44008901, 4.74402637)	(.00000000, .00000000)	.02740	(.42663377-012, .3093726-012)		
11	(-1.06950772, 2.21300684)	(.00000000, .00000000)	.02800	(.2450513-012, .1184290-012)		
12	(-95694717, .05947624)	(.00000000, .00000000)	.02860	(.4721988-013, .7597476-012)		
13	(-1.9430181, -.29002248)	(.00000000, .00000000)	.02900	(.3876009-013, .2596749-013)		
14	(-.05058958, -.10776355)	(.00000000, .00000000)	.02940	(.2401092-013, .1127192-013)		
15	(.03790196, -.00434092)	(.00000000, .00000000)	.03600	(.5007585-014, .4372279-013)		
16	(.00721573, .00898518)	(.00000000, .00000000)	.03040	(.3985341-014, .3200510-014)		
17	(-.00104569, .00312019)	(.00000000, .00000000)	.03100	(.4044231-014, .1355364-014)		
18	(-.00086202, .0022427)	(.00000000, .00000000)	.03140	(.7008470-015, .2693794-014)		
19	(-.00017037, -.00015315)	(.00000000, .00000000)	.03180	(.4925137-015, .5478718-015)		
20	(-.00000799, -.00005554)	(.00000000, .00000000)	.03200	(.1419079-014, .2041467-015)		
21	(.00001181, -.00000572)	(.00000000, .00000000)	.03240	(.1263727-015, .2608485-015)		
22	(.00000254, .00000146)	(.00000000, .00000000)	.03900	(.7522071-016, .1309106-015)		
23	(.00000005, .00000063)	(.00000000, .00000000)	.03300	(.4750943-015, .3818866-016)		
24	(-.00000010, .00000008)	(.00000000, .00000000)	.03300	(.2917047-016, .3569443-016)		
25	(-.00000002, -.0000001)	(.00000000, .00000000)	.03300	(.1415563-016, .4963272-016)		
26	(.00000000, .00000000)	(.00000000, .00000000)	.03280	(.2550355-016, .8807838-017)		
27	(.00000000, .00000000)	(.00000000, .00000000)	.03300	(.8816154-017, .6368827-017)		

TABLE 24 FOR Z=(5.0, -8.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(-373.83648469, -11.77559129)	(-.0000001745, .0000001643)		.02280	(.4448197-009, .1412157-007)
2	(-40.11033558, 323.14293509)	(-.0000006837, .0000007161)		.02320	(.1029250-008, .1277563-009)
3	(248.63670227, 69.97028750)	(.0000000588, .00000002360)		.02360	(.3916038-010, .1391549-009)
4	(86.18367567, -165.46124594)	(.0000000538, .0000000177)		.02380	(.2537657-010, .1321787-010)
5	(-90.91909815, -82.36011441)	(.0000000097, -.0000000080)		.02460	(.5157569-011, .5693551-011)
6	(-63.23025718, 37.46648670)	(-.0000000003, -.0000000026)		.02520	(.1520941-011, .25666814-011)
7	(7.87866944, 39.41499657)	(-.0000000005, -.0000000002)		.03260	(.2399044-011, .4795453-012)
8	(19.82606892, 3.44880249)	(-.0000000001, .0000000001)		.02640	(.1798786-012, .1034065-011)
9	(4.98244062, -7.80105252)	(.0000000000, .0000000000)		.02700	(.1298571-012, .8293820-013)
10	(-2.16571815, -3.27603033)	(.0000000000, .0000000000)		.02760	(.5219238-013, .3450334-013)
11	(-1.52633908, .22669368)	(.0000000000, .0000000000)		.02820	(.1247570-013, .8399948-013)
12	(-1.6906147, .53783512)	(.0000000000, .0000000000)		.02880	(.1832054-013, .5758825-014)
13	(.13811751, .13376039)	(.0000000000, .0000000000)		.03520	(.3525965-014, .3640820-014)
14	(.058119761, -.01966329)	(.0000000000, .0000000000)		.02980	(.1273283-014, .3768547-014)
15	(.00291891, -.01821652)	(.0000000000, .0000000000)		.03020	(.3742180-014, .5996251-015)
16	(-.00415491, -.00316749)	(.0000000000, .0000000000)		.03060	(.3757808-015, .4929245-015)
17	(-.00127742, .00057094)	(.0000000000, .0000000000)		.03120	(.1695704-015, .37793934-015)
18	(-.000003000, .00035405)	(.0000000000, .0000000000)		.03140	(.9730814-015, .8245522-016)
19	(.00007106, .0004803)	(.0000000000, .0000000000)		.03180	(.5382936-016, .7964445-016)
20	(.00001765, -.00000880)	(.0000000000, .0000000000)		.03840	(.2762365-016, .5543248-016)
21	(.00000024, -.00000432)	(.0000000000, .0000000000)		.03260	(.2514734-015, .1400024-016)
22	(-.00000076, -.00000050)	(.0000000000, .0000000000)		.03300	(.9604841-017, .1476051-016)
23	(-.00000016, .0000008)	(.0000000000, .0000000000)		.03320	(.5290333-017, .1042216-016)
24	(.00000000, .00000004)	(.0000000000, .0000000000)		.03300	(.4921983-016, .2814212-017)
25	(.00000001, .00000000)	(.0000000000, .0000000000)		.03320	(.2639874-017, .3071285-017)
26	(.00000000, .00000000)	(.0000000000, .0000000000)		.03900	(.1159749-017, .2380969-017)
27	(.00000000, .00000000)	(.0000000000, .0000000000)		.03300	(.8129326-017, .6506281-018)

TABLE 25 FOR Z=(9.0, 6.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(47.77790403, 14.03828260)	(-0.000025128, .0000017054)	.02280	(.2674937-007, .91038882-007)	
2	(-7.19836507, 45.04135623)	(-.0000076044, .0000055279)	.02300	(.4672219-007, .7466990-008)	
3	(-39.27145538, 2.10255909)	(-.0000024365, -.0000000210)	.02340	(.2141017-008, .3998976-007)	
4	(-10.89501225, -29.89440392)	(-.0000004779, -.0000003610)	.03000	(.1837469-008, .6696654-009)	
5	(17.94933365, -16.00537172)	(-.000000393, -.0000001344)	.02440	(.2534818-009, .2842689-009)	
6	(15.65125614, 6.32050636)	(.0000000109, -.0000000293)	.02520	(.6319577-010, .1564896-009)	
7	(1.62663683, 10.80415341)	(.0000000056, -.0000000036)	.02580	(.1266792-009, .1907240-010)	
8	(-4.75393403, 4.41377052)	(.000000014, .000000001)	.02640	(.8669077-011, .9337191-011)	
9	(-3.47445269, -59075047)	(.000000002, .000000002)	.02700	(.2281058-011, .1341586-010)	
10	(-.88728836, -1.51204229)	(.000000000, .000000000)	.02740	(.1654109-011, .9706551-012)	
11	(.24034057, -7.6377116)	(.000000000, .000000000)	.03420	(.1090470-011, .3431449-012)	
12	(.30210983, -14944450)	(.000000000, .000000000)	.02860	(.1495712-012, .3023660-012)	
13	(.12451022, .04179957)	(.000000000, .000000000)	.02900	(.6048625-013, .1801731-012)	
14	(.02207875, .04215166)	(.000000000, .000000000)	.02960	(.5501663-013, .2881743-013)	
15	(-.00423903, .01552787)	(.000000000, .000000000)	.03000	(.4477373-013, .1222301-013)	
16	(-.00430226, .00274548)	(.000000000, .000000000)	.03040	(.6684200-014, .1047438-013)	
17	(-.00150344, -.00023911)	(.000000000, .000000000)	.03080	(.2812883-014, .1768637-013)	
18	(-.00027488, -.00032884)	(.000000000, .000000000)	.03720	(.2197870-014, .1827170-014)	
19	(.0000149, -.00011423)	(.000000000, .000000000)	.03180	(.5625624-013, .7345732-015)	
20	(.00001897, -.00002181)	(.000000000, .000000000)	.03220	(.5976948-015, .5199223-015)	
21	(.00000687, -.0000109)	(.000000000, .000000000)	.03240	(.2170238-015, .1366110-014)	
22	(.00000138, .00000082)	(.000000000, .000000000)	.03280	(.1390518-015, .2346351-015)	
23	(.00000012, .0000033)	(.000000000, .000000000)	.03300	(.1999775-015, .7242451-016)	
24	(-.00000002, .0000007)	(.000000000, .000000000)	.03900	(.1193497-015, .4184330-016)	
25	(-.00000001, .0000001)	(.000000000, .000000000)	.03300	(.2736264-016, .4441435-016)	
26	(.0000000, .0000000)	(.000000000, .000000000)	.03280	(.1408143-016, .1108014-015)	
27	(.0000000, .0000000)	(.000000000, .000000000)	.03300	(.1223766-016, .1182797-016)	

TABLE 26 FOR Z=(9.0, -4.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(5.62811134, 3.89716409)	(.0000018873, -0.0000004364)	.02280	(.1332549-006, .1924409-006)		
2	(4.41358755, -4.72678839)	(.0000952392, -0.0000011836)	.02320	(.4404093-007, .4112274-007)		
3	(-3.21040237, -4.92342162)	(.0000011006, -0.0000008124)	.02360	(.1490784-007, .9720914-008)		
4	(-4.98265568, 1.19158814)	(.0000001644, -0.0030002868)	.02380	(.2252422-008, .9418560-008)		
5	(-88116494, -4.16413671)	(.000000080, -0.000000756)	.02440	(.2850931-008, .6032800-009)		
6	(2.44791018, 2.30867687)	(-0.000000051, -0.0000000159)	.02500	(.2197235-009, .2329747-009)		
7	(2.46423514, -3.38231413)	(-0.000000023, -0.000000026)	.02580	(.4478519-010, .2886664-009)		
8	(.9737249, -1.38263988)	(-0.00000006, -0.000000003)	.02660	(.2232415-010, .1572256-010)		
9	(-10637750, -1.02777560)	(-0.00000001, .0000000001)	.03320	(.3870483-010, .4006052-011)		
10	(-38854891, -4.1281195)	(.000000000, .000000000)	.02780	(.1932686-011, .1819092-011)		
11	(-27417763, -0.5871990)	(.000000000, .000000000)	.02820	(.4816958-012, .2249156-011)		
12	(-11784099, .04421225)	(.000000000, .000000000)	.02860	(.1903121-012, .5072478-012)		
13	(-03198762, .04054578)	(.000000000, .000000000)	.02920	(.1150841-012, .9079285-013)		
14	(-00279679, .01930323)	(.000000000, .000000000)	.02960	(.2090893-012, .3029435-013)		
15	(.00243347, .00637352)	(.000000000, .000000000)	.03640	(.3698036-013, .1411946-013)		
16	(.00168560, .00142798)	(.000000000, .000000000)	.03060	(.7966806-014, .9274196-014)		
17	(.00066046, .00014994)	(.000000000, .000000000)	.03100	(.2944874-014, .1297158-013)		
18	(.00018770, -0.00004896)	(.000000000, .000000000)	.03160	(.1457959-014, .5589784-014)		
19	(.00003916, -0.00003482)	(.000000000, .000000000)	.03200	(.9558685-015, .1074974-014)		
20	(.00000494, -0.0001245)	(.000000000, .000000000)	.03220	(.1007682-014, .4000629-015)		
21	(-0.0000027, -0.0000324)	(.000000000, .000000000)	.03260	(.2384572-014, .1992301-015)		
22	(-0.0000039, -0.0000064)	(.000000000, .000000000)	.03920	(.2108813-015, .1265706-015)		
23	(-0.0000014, -0.000009)	(.000000000, .000000000)	.03320	(.7230989-016, .1112071-015)		
24	(-0.0000003, .0000000)	(.000000000, .000000000)	.03320	(.3482733-016, .2751845-015)		
25	(-0.0000001, .0000000)	(.000000000, .000000000)	.03300	(.2115325-016, .6338889-016)		
26	(.0000000, .0000000)	(.000000000, .000000000)	.03320	(.1648137-016, .1707480-016)		
27	(.0000000, .0000000)	(.000000000, .000000000)	.03300	(.2024732-016, .7610214-017)		

TABLE 1 FOR Z=(1.0, 1.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR	
1	(.61410033,	.36502803)	(.000000000,	.000000000)	.02280	(.3857303-035,	.6489920-035)
2	-04157979,	24739764)	-000000000,	-000000000)	.02320	(-2120380-035,	.3563702-036)
3	(-0.3620526,	.04660748)	(.000000000,	.000000000)	.02360	(.8609542-037,	.6688001-037)
4	(-0.01037318,	.00104063)	(.000000000,	.000000000)	.02400	(.1011816-037,	.1008602-036)
5	(-0.00112631,	-0.0095183)	(.000000000,	-000000000)	.02460	(-2997840-038,	.3544233-038)
6	(-0.0001219,	-0.00117322)	(.000000000,	.000000000)	.02520	(.8368335-038,	.5987284-039)
7	(.00001100,	-0.0001315)	(.000000000,	.000000000)	.03200	(.26331186-039,	.2323028-039)
8	(-0.0000135,	-0.0000009)	(.000000000,	-000000000)	.02680	(.5583415-040,	.1003999-038)
9	(.0000009,	.0000008)	(.000000000,	.000000000)	.02720	(.2602364-040,	.2876534-040)
10	(.00000030,	.0000001)	(.000000000,	.000000000)	.02760	(.1573043-039,	.7155059-041)
11	(.00000020,	.0000000)	(.000000000,	-000000000)	.02820	(.4147570-041,	.3815582-041)
12	(.00000000,	.0000000)	(.000000000,	.000000000)	.02880	(.1162835-041,	.3021894-040)
13	(.00000000,	.0000000)	(.000000000,	.000000000)	.02920	(.6879693-042,	.7389523-042)
14	(.00000000,	.0000000)	(.000000000,	-000000000)	.02960	(.6823323-041,	.2275278-042)
15	(.00000000,	.0000000)	(.000000000,	.000000000)	.03020	(.1556886-042,	.1462500-042)
16	(.00000000,	.0000000)	(.000000000,	.000000000)	.03680	(.5170504-043,	.1757467-041)
17	(.00000000,	.0000000)	(.000000000,	-000000000)	.03100	(.3557108-043,	.3760424-043)
18	(.0000000,	.0000000)	(.000000000,	.000000000)	.03160	(.5050759-042,	.1329452-043)
19	(.00000000,	.0000000)	(.000000000,	.000000000)	.03180	(.1017708-043,	.9680532-044)
20	(.0000000,	.0000000)	(.000000000,	-000000000)	.03840	(.3792511-044,	.1592555-042)
21	(.00000000,	.0000000)	(.000000000,	.000000000)	.03260	(.2898050-044,	.3032866-044)
22	(.00000000,	.0000000)	(.000000000,	-000000000)	.03300	(.5437397-043,	.1182229-044)
23	(.00000000,	.0000000)	(.000000000,	-000000000)	.03320	(.9817957-045,	.9417167-045)
24	(.00000000,	.0000000)	(.000000000,	.000000000)	.03320	(.3979072-045,	.1989272-043)
25	(.00000000,	.0000000)	(.000000000,	.000000000)	.03300	(.3286305-045,	.3415196-045)
26	(.00000000,	.0000000)	(.000000000,	-000000000)	.03320	(.7732323-044,	.1432075-045)
27	(.00000000,	.0000000)	(.000000000,	.000000000)	.03920	(.1265357-046,	.1220954-045)

TABLE 2 FOR $Z = (1.0 \dots 9.0)$

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(836.40934630, 598.33271369)	(-.0000000056,	.0000000078)	.02280	(.4740937-010, .6627356-010)
2	(-488.54308327, -713.12806864)	(-.0000001099,	.000000172)	.02320	(.1934209-010, .1325070-010)
3	(-547.16010271, -349.06364939)	(-.0000000443,	-.0000000190)	.02360	(.3909659-011, .6128422-011)
4	(218.63579445, -378.34436559)	(.0000000031,	-.0000000103)	.02380	(.2109549-011, .1219056-011)
5	(-236.28561531, -420.1791128)	(.0000000023,	.000000004)	.03080	(.4017241-012, .7898347-012)
6	(-57.91657288, 133.66248430)	(.000000000,	.000000005)	.02520	(.3226350-012, .1397992-012)
7	(-68.71793924, -24.33838345)	(-.000000001,	.000000000)	.02600	(.5129911-013, .1448399-012)
8	(-8.78623793, -332.22683810)	(.000000000,	.000000001)	.02660	(.7266310-013, .1981067-013)
9	(13.83885543, 2.62072892)	(.000000000,	.000000000)	.02720	(.8033787-014, .4242271-013)
10	(-57090277, 5.46194225)	(.000000000,	.000000000)	.02760	(.3265664-013, .3413395-014)
11	(-1.98847058, -.03534667)	(.000000000,	.000000000)	.03460	(.1516119-014, .8529116-013)
12	(-0.04793d33, -.66999630)	(.000000000,	.000000000)	.02880	(.9818515-014, .7025206-015)
13	(.20957157, -.03447243)	(.000000000,	.000000000)	.02920	(.3389649-015, .2060702-014)
14	(.01601551, -06102032)	(.000000000,	.000000000)	.02980	(.6478269-015, .1700309-015)
15	(-.01657697, .00608994)	(.000000000,	.000000000)	.03020	(.8855727-016, .2410550-015)
16	(-.00202811, -.00420959)	(.000000000,	.000000000)	.03060	(.9931194-016, .4784679-016)
17	(.00100662, -.00060960)	(.000000000,	.000000000)	.03100	(.2680529-016, .4399927-016)
18	(.00016315, .00022280)	(.000000000,	.000000000)	.03740	(.2063484-016, .1557341-016)
19	(-.00004C47, .00004302)	(.000000000,	.000000000)	.03200	(.9391424-017, .1014503-016)
20	(-.00001023, -.00000907)	(.000000000,	.000000000)	.03220	(.5194819-017, .5890185-017)
21	(.00000165, -.00000231)	(.000000000,	.000000000)	.03260	(.3856329-017, .2757593-017)
22	(.00000049, .00000028)	(.000000000,	.000000000)	.03300	(.1512256-017, .2652751-017)
23	(-.00000034, -.0000010)	(.000000000,	.000000000)	.03320	(.1940129-017, .0544748-018)
24	(-.00000022, -.0000001)	(.000000000,	.000000000)	.03940	(.4964202-018, .1544112-017)
25	(.00000500, .0000000)	(.000000000,	.000000000)	.03300	(.1411360-017, .2960522-018)
26	(-.00000030, -.0000000)	(.000000000,	.000000000)	.03300	(.1810115-C18, .1767793-017)
27	(.00000000, .00000000)	(.000000000,	.000000000)	.03320	(.36760666-015, .1133574-018)

TABLE 3 FOR Z=(2.0,-9.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(375.22483307, 124.04942485)	(-0.000000006, -0.000000001)	.02260	(.3991673-011,	.1207402-010)
2	(-118.19933724, -305.96493159)	(-0.000000058, -0.000000008)	.02320	(.2749808-011,	.1062297-011)
3	(-217.33550577, -104.42208163)	(-0.000000001, .0000000013)	.02340	(.3083054-012,	.6416816-012)
4	(-82.8429710, 134.12415005)	(-0.000000002, .000000001)	.02380	(.1588040-012,	.9808669-013)
5	(-71.60862374, -58.01084974)	(-0.000000009, -0.00000000)	.02440	(.3443131-013,	.4250203-013)
6	(35.65627427, -32.81668984)	(-0.00000000, -0.00000000)	.02520	(.1239594-013,	.1346855-013)
7	(-12.69441638, -19.25494131)	(-0.00000000, -0.00000000)	.02580	(.5981486-014,	.3943542-014)
8	(-9.169444643, -3.97940386)	(-0.00000000, -0.00000000)	.02640	(.1365746-014,	.3146988-014)
9	(.88893974, 3.86746364)	(-0.00000000, -0.00000000)	.03300	(.22334045-014,	.5134971-015)
10	(1.45014364, -0.04946248)	(-0.00000000, -0.00000000)	.02760	(.2091293-015,	.6131251-014)
11	(08046646, -48446360)	(-0.00000000, -0.00000000)	.02800	(.5549789-015,	.9217863-016)
12	(-1.14416032, -0.05574784)	(-0.00000000, -0.00000000)	.02860	(.4404007-016,	.1138911-015)
13	(-0.02182667, .03804868)	(-0.00000000, -0.00000000)	.02920	(.3514816-016,	.2293409-016)
14	(-0.00375402, -0.0390348)	(-0.00000000, -0.00000000)	.02960	(.1319015-016,	.1303539-016)
15	(.00274380, -0.00173140)	(-0.00000000, -0.00000000)	.03020	(.5450118-017,	.8636960-017)
16	(-0.00026720, -0.0074719)	(-0.00000000, -0.00000000)	.03680	(.6992625-017,	.2500563-017)
17	(-0.00018233, -0.0002225)	(-0.00000000, -0.00000000)	.03100	(.1242689-017,	.1018269-016)
18	(-0.00004114, .00004013)	(-0.00000000, -0.00000000)	.03140	(.6452408-017,	.6650936-018)
19	(.000000738, .00000272)	(-0.00000000, -0.00000000)	.03180	(.3831949-018,	.1123324-017)
20	(-0.00000039, -0.0000143)	(-0.00000000, -0.00000000)	.03200	(.3841909-018,	.2389589-018)
21	(-0.00000023, -0.00000023)	(-0.00000000, -0.00000000)	.03260	(.1636692-018,	.1636211-018)
22	(-0.00000005, .00000003)	(-0.00000000, -0.00000000)	.03900	(.7903741-019,	.1275196-018)
23	(-0.00000009, -0.0000001)	(-0.00000000, -0.00000000)	.03300	(.1248349-018,	.4183074-019)
24	(.00000000, .00000000)	(-0.00000000, -0.00000000)	.03300	(.2388868-019,	.2623761-018)
25	(.00000000, .00000000)	(-0.00000000, -0.00000000)	.03300	(.1018890-018,	.1463228-019)
26	(-0.00000000, -0.00000000)	(-0.00000000, -0.00000000)	.03300	(.9617554-020,	.2429949-019)
27	(.00000000, .00000000)	(-0.00000000, -0.00000000)	.03300	(.9741434-020,	.6835184-020)

TABLE 4 FOR Z=1 2.0. -2.0)

N	JN	BESL. EQ.		TIME	REL. ERROR	
		BESL	EQ.			
1	(1.61701879,	.27260958)	(.000000000,	.000000000)	.02300 (.5033851-025,	.2985893-024)
2	(-64455012	- 83518078)	(.000000000,	.000000000)	02320 (.9399832-026,	.7254313-026)
3	(-13728788,	- 46324024)	(.000000000,	.000000000)	.02360 (.31205339-026,	.9248164-027)
4	(-15562160,	- 06561140)	(.000000000,	.000000000)	.02400 (.1853906-027,	.4397220-027)
5	(-04272250,	- 02077424)	(.000000000,	.000000000)	.02460 (.4340018-028,	.8927392-028)
6	(-00314526,	.01071575)	(.000000000,	.000000000)	.02540 (.3625602-028,	.1064178-028)
7	(.00114345,	.00193723)	(.000000000,	.000000000)	.03220 (.5845875-029,	.3468636-029)
8	(.00033803,	.00008765)	(.000000000,	.000000000)	.02660 (.9796054-030,	.4336761-029)
9	(.00005207,	- 00003452)	(.000000000,	.000000000)	.02720 (.3971060-030,	.5989809-030)
10	(.00000160,	- 00000868)	(.000000000,	.000000000)	.02760 (.6783323-030,	.1246924-030)
11	(-00000166	- 00000092)	(.000000000,	.000000000)	.02820 (.8309070-031,	.5916235-031)
12	(-00000013,	- 00000002)	(.000000000,	.000000000)	.02880 (.2018514-031,	.1301766-030)
13	(-00000001,	.00000001)	(.000000000,	.000000000)	.03540 (.1079858-031,	.1442669-031)
14	(-00000000	- 00000000)	(.000000000,	.000000000)	.02960 (.2937341-031,	.3939656-032)
15	(.00000000,	.00000000)	(.000000000,	.000000000)	.03020 (.2984018-032,	.12317835-032)
16	(.00000000,	.00000000)	(.000000000,	.000000000)	.03060 (.8937595-033,	.7562080-032)
17	(-00000000,	.00000000)	(.000000000,	.000000000)	.03100 (.5681583-033,	.7108556-033)
18	(.00000000,	.00000000)	(.000000000,	.000000000)	.03140 (.2172516-032,	.2295302-033)
19	(.00000000,	.00000000)	(.000000000,	.000000000)	.03180 (.1903294-033,	.1556192-033)
20	(-00000000,	.00000000)	(.000000000,	.000000000)	.03840 (.6542024-034,	.6848427-033)
21	(.00000000,	.00000000)	(.000000000,	.000000000)	.03260 (.4683933-034,	.5623558-034)
22	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300 (.2337779-033,	.2037973-034)
23	(-00000000,	.00000000)	(.000000000,	.000000000)	.03320 (.1807736-034,	.1529029-034)
24	(.00000000,	.00000000)	(.000000000,	.000000000)	.03320 (.6855765-035,	.8551468-034)
25	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300 (.5356938-035,	.6251668-035)
26	(-00000000,	.00000000)	(.000000000,	.000000000)	.03320 (.3323565-034,	.2466401-035)
27	(.00000000,	.00000000)	(.000000000,	.000000000)	.03940 (.2304899-035,	.1997092-035)

TABLE 5 FOR Z= (3.0, 3.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(1.63645140, -3.27863344)	(.0000000000, .0000000000)	.02280	(.7242798-019, .3615069-019)
2	(2.81910342, -45706761)	{ .0000000000, .0000000000}	02320	{ .4694081-020, .2895221-019)
3	(.54766488, 1.70394064)	(.0000000000, .0000000000)	.02360	(.2562852-020, .3237282-021)
4	(-56750130, .69320815)	(.0000000000, .0000000000)	.02380	(.2498380-021, .2027771-021)
5	(-37205374, -01499471)	{ .0000000000, .0000000000)	03080	{ .3674522-022, .9117401-021)
6	(-07758273, -10410641)	(.0000000000, .0000000000)	.02540	(.1625257-022, .1211183-022)
7	(.00867735, -03805257)	{ .0000000000, .0000000000)	.02600	{ .1284383-022, .2928858-023)
8	(.00904003, -00493009)	{ .0000000000, .0000000000)	.02660	{ .1046044-023, .1918199-023)
9	(.00228107, .00079732)	{ .0000000000, .0000000000)	.02720	{ .3378102-024, .9677122-024)
10	(.00020255, .00046987)	{ .0000000000, .0000000000)	.02780	{ .2978224-024, .1290180-024)
11	(-00003935, -00009040)	{ .0000000000, .0000000000)	.03420	{ .1167016-024, .5080415-025)
12	(-00001633, .00000590)	{ .0000000000, .0000000000)	.02880	{ .2051264-025, .5689620-025)
13	(-00000254, -00000127)	{ .0000000000, .0000000000)	.02920	{ .9358693-026, .1869803-025)
14	(-00000013, -00000041)	{ .0000000000, .0000000000)	.02980	{ .1280017-025, .3958631-026)
15	(.00000003, -0.00000005)	{ .0000000000, .0000000000)	.03020	{ .3671314-026, .2025699-026)
16	(.00000001, .00000000)	{ .0000000000, .0000000000)	.03060	{ .8913030-027, .3288601-026)
17	(-00000000, -00000000)	{ .0000000000, .0000000000)	03100	{ .5002759-027, .8433107-027)
18	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03780	{ .9433886-027, .2276868-027)
19	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03200	{ .2198095-027, .1379365-027)
20	(.00000000, -00000000)	{ .0000000000, .0000000000)	.03220	{ .6464366-028, .2970573-027)
21	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03260	{ .4176110-028, .6362117-028)
22	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03300	{ .1013182-027, .2007912-028)
23	(.00000000, -00000000)	{ .0000000000, .0000000000)	.03320	{ .2012091-028, .1370366-028)
24	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03940	{ .6739441-029, .3703726-028)
25	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03320	{ .4823376-029, .2867126-029)
26	(.00000000, -00000000)	{ .0000000000, .0000000000)	.03320	{ .1438715-028, .2420254-029)
27	(.00000000, .00000000)	{ .0000000000, .0000000000)	.03300	{ .2502348-029, .1805657-029)

TABLE 6 FOR Z=(3.0, 7.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(-47.819363, -143.39837964)	(- .0000000001, .0000000000)	.02280	(.1936095-011, .6456338-012)
2	(121.55481076, 29.07368380)	(- .0000000003, - .0000000001)	.02300	(.1526472-012, .6382059-012)
3	(-8.63452055, 90.73199178)	(.0000000000, - .0000000001)	.02340	(.4091444-012, .3893628-013)
4	(-58.5320137, 5.33710468)	(.0000000000, .0000000000)	.02380	(.1094425-013, .1200256-012)
5	(-10.43255.71, -32.00986708)	(.0000000000, .0000000000)	.02460	(.1062797-013, .3463834-014)
6	(14.50326517, -9.30291697)	(.0000000000, .0000000000)	.02520	(.1265702-014, .1973231-014)
7	(5.9613927, 5.23091388)	(.0000000000, .0000000000)	.02580	(.4885648-015, .5567911-015)
8	(-1.34795.20, 3.01812283)	(.0000000000, .0000000000)	.02660	(.3291082-015, .1469863-015)
9	(-1.24884.32, -1.13021101)	(.0000000000, .0000000000)	.03320	(.5202562-016, .4989727-015)
10	(-0.09763231, -4.2635367)	(.0000000000, .0000000000)	.02760	(.9385365-016, .2149190-016)
11	(-1.11871.33, -0.07518031)	(.0000000000, .0000000000)	.02820	(.1049719-016, .1657550-016)
12	(-0.03310263, .02560061)	(.0000000000, .0000000000)	.02860	(.4943041-017, .6391552-017)
13	(-0.03406341, .01107691)	(.0000000000, .0000000000)	.02920	(.5991552-017, .1874999-017)
14	(-0.00300173, -.00017328)	(.0000000000, .0000000000)	.02960	(.8487582-018, .1472316-016)
15	(-0.00039124, -.000666848)	(.0000000000, .0000000000)	.03020	(.1007785-017, .4541389-018)
16	(-0.0011890, -.00011989)	(.0000000000, .0000000000)	.03680	(.2968762-018, .2921981-018)
17	(-0.00035.53, -.00001433)	(.0000000000, .0000000000)	.03100	(.1169954-018, .2737066-018)
18	(-0.00000021, .00000749)	(.0000000000, .0000000000)	.03140	(.2081042-017, .5698850-019)
19	(-0.00000137, .00000050)	(.0000000000, .0000000000)	.03180	(.3288167-019, .8957239-019)
20	(-0.0000017, -.00000020)	(.0000000000, .0000000000)	.03200	(.2552859-019, .2299890-019)
21	(.00000002, -.0000004)	(.0000000000, .0000000000)	.03260	(.2200357-019, .1073724-019)
22	(.00000001, .00000000)	(.0000000000, .0000000000)	.03880	(.5565224-020, .8085115-019)
23	(-0.0000010, -.00000000)	(.0000000000, .0000000000)	.03300	(.1039430-019, .3422541-020)
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.2543368-020, .2981362-020)
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1315283-020, .2557021-020)
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03280	(.8493679-020, .7199387-021)
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.4679409-021, .1476276-020)

TABLE 7 FOR Z=(4.0, -6.0)

N	IN	BESL.	EQ.	TIME	REL. ERROR
1	(-32.22960124, 47.40785875)	(.0000000000, .0000000000)	.02280	(.4249562-012, .2889008-012)	
2	(-35.84847449, 31.83102460)	(.0000000000, .0000000000)	.02320	(.7250142-013, .8165195-013)	
3	(28.56865396, -21.06824757)	(.0000000000, .0000000000)	.02360	(.1640095-013, .2223978-013)	
4	(-8.07722573, -21.77652881)	(.0000000000, .0000000000)	.02380	(.9959759-014, .3694219-014)	
5	(-13.43785165, 21140240)	(.0000000000, .0000000000)	.02460	(.9811388-015, .6236635-013)	
6	(-2.50350432, 6.43393374)	(.0000000000, .0000000000)	.02540	(.8255735-015, .3212384-015)	
7	(2.2183926, 2.26122276)	(.0000000000, .0000000000)	.03200	(.1399667-015, .1373160-015)	
8	(1.23986597, -41520159)	(.0000000000, .0000000000)	.02660	(.3611956-016, .1078542-015)	
9	(.07404110, -48336754)	(.0000000000, .0000000000)	.02720	(.8387291-016, .1284745-016)	
10	(-13337033, -10029888)	(.0000000000, .0000000000)	.02780	(.6217893-017, .8268112-017)	
11	(-04776726, 02128389)	(.0000000000, .0000000000)	.02820	(.2235557-017, .5017242-017)	
12	(-.00149131, .01506243)	(.0000000000, .0000000000)	.02860	(.8881257-017, .8814440-018)	
13	(.00329107, .00238392)	(.0000000000, .0000000000)	.03500	(.4841090-018, .693430-018)	
14	(.00093530, -.00040637)	(.0000000000, .0000000000)	.02980	(.1984253-018, .4566987-018)	
15	(.00003131, -.00023742)	(.0000000000, .0000000000)	.03020	(.6678347-018, .8807497-019)	
16	(-.00004121, -.00003314)	(.0000000000, .0000000000)	.03060	(.5544707-019, .6894014-019)	
17	(-.00001037, .00000370)	(.0000000000, .0000000000)	.03100	(.2335275-019, .6543035-019)	
18	(-.00000016, .00000212)	(.0000000000, .0000000000)	.03140	(.5472510-019, .1175459-019)	
19	(.00000029, .00000028)	(.0000000000, .0000000000)	.03200	(.8563107-020, .8845050-020)	
20	(.00000007, -.00000002)	(.0000000000, .0000000000)	.03840	(.3468724-020, .1410253-019)	
21	(.00000000, -.00000001)	(.0000000000, .0000000000)	.03260	(.5956318-020, .1984878-020)	
22	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1698435-020, .1385195-020)	
23	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.6274902-021, .5323557-020)	
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.8440259-021, .4089166-021)	
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.4226955-021, .2589736-021)	
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03940	(.1345513-021, .6234720-020)	
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.1485065-021, .1002987-021)	

TABLE 8 FOR Z-4 A.0 -4.0

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(-4.33745219, 7.59139379)	(.0000000000, .0000000000)	.02280	(.6448081-015,	.3684204-015)
2	(5.40211717, -4.84169783)	(.0000000000, .0000000000)	.02340	(-7707129-016,	.8599218-016)
3	(4.61766281, -2.46948615)	(.0000000000, .0000000000)	.02340	(.1275115-016,	.2384323-016)
4	(-0.08675575, -3.23056533)	(.0000000000, .0000000000)	.02400	(.9141112-016,	.2454815-017)
5	(-1.47365323, -.84783493)	(.0000000000, .0000000000)	.03050	(.6917759-018,	.1202564-017)
6	(-6.9576712, .32845512)	(.0000000000, .0000000000)	.02540	(.1802075-018,	.3817339-018)
7	(-.06248013, .29686694)	(.0000000000, .0000000000)	.02600	(.2364986-018,	.4977471-019)
8	(-.06690274, -.08172180)	(.0000000000, .0000000000)	.02640	(.42498539-019,	.2045680-019)
9	(.03285512, .00039612)	(.0000000000, .0000000000)	.02700	(.5535187-020,	.4591088-018)
10	(.00612132, -.00690448)	(.0000000000, .0000000000)	.02780	(.3110433-020,	.2759292-020)
11	(-.00026227, -.00234476)	(.0000000000, .0000000000)	.03460	(.6817817-020,	.8207601-021)
12	(-.00045317, -.00031988)	(.0000000000, .0000000000)	.02830	(.4141902-021,	.5867864-021)
13	(-.00011711, .0002562)	(.0000000000, .0000000000)	.02920	(.1504652-021,	.6907261-021)
14	(-.00001233, -.00002090)	(.0000000000, .0000000000)	.02960	(.1309357-021,	.7723947-022)
15	(.00000129, .00000438)	(.0000000000, .0000000000)	.03020	(.1108308-021,	.3255134-022)
16	(.00000132, .00000037)	(.0000000000, .0000000000)	.03050	(.1700819-022,	.3345098-022)
17	(.0000013, -.0000004)	(.0000000000, .0000000000)	.03100	(.8051597-023,	.2268162-022)
18	(.00000131, -.0000002)	(.0000000000, .0000000000)	.03760	(.9557274-023,	.4278731-023)
19	(.00000130, .0000000)	(.0000000000, .0000000000)	.03180	(.5484841-023,	.2225710-023)
20	(-.00000133, -.0000000)	(.0000000000, .0000000000)	.03240	(.1201466-023,	.3000416-023)
21	(.00000130, .0000000)	(.0000000000, .0000000000)	.03260	(.6758926-024,	.1506144-023)
22	(.00000132, .0000000)	(.0000000000, .0000000000)	.03300	(.1021022-023,	.3701348-024)
23	(-.00000130, .0000000)	(.0000000000, .0000000000)	.03320	(.4581478-024,	.2225000-024)
24	(.00000130, .0000000)	(.0000000000, .0000000000)	.03920	(.1234539-024,	.3725729-024)
25	(.00000130, .0000000)	(.0000000000, .0000000000)	.03320	(.7856605-025,	.1517507-024)
26	(-.00000130, -.0000000)	(.0000000000, .0000000000)	.03320	(.445208-C24,	.4411634-025)
27	(.00000130, .0000000)	(.0000000000, .0000000000)	.03300	(.5404426-C25,	.2950359-025)

TABLE 9 FOR Z=(5.0, 5.0)

N	UN	BESL. EQ.	TIME	REL. ERROR
1	(-21.41287416, -1.36141081)	(.000000000, .000000000)	.02260	(.3219888-012, .5064382-011)
2	(-1.87891369, -18.37175618)	(.000000000, .000000000)	.02320	(.6828262-012, .9833392-013)
3	(13.31266010, -5.23572606)	(.000000000, .000000000)	.02360	(.1703645-013, .4331768-013)
4	(6.72504201, 7.24275688)	(.000000000, .000000000)	.02360	(.5677836-014, .5271982-014)
5	(-2.13830179, 5.64989796)	(.000000000, .000000000)	.02460	(.2869643-014, .1086099-014)
6	(-3.2135103, .54550806)	(.000000000, .000000000)	.02540	(.2935334-015, .1729164-014)
7	(-1.06323559, -1.13907505)	(.000000000, .000000000)	.02600	(.1306927-015, .1219913-015)
8	(-1.13027474, -.65168191)	(.000000000, .000000000)	.02660	(.1508467-015, .3015598-016)
9	(.22885613, -.11205559)	(.000000000, .000000000)	.03340	(.1166999-016, .2384757-016)
10	(.08019211, .03780861)	(.000000000, .000000000)	.02780	(.4363181-017, .9255040-017)
11	(.00702692, .02727598)	(.000000000, .000000000)	.02820	(.6286045-017, .1619890-017)
12	(-.00472764, .00673493)	(.000000000, .000000000)	.02880	(.1139407-017, .7998154-018)
13	(-.00221161, .00023418)	(.000000000, .000000000)	.02920	(.2870698-018, .2710831-017)
14	(-.00041316, -.00037639)	(.000000000, .000000000)	.02960	(.1752415-018, .923580-018)
15	(.00000068, -.000113124)	(.000000000, .000000000)	.03620	(.1176678-016, .0095005-019)
16	(.00002446, -.00001938)	(.000000000, .000000000)	.03060	(.3993418-019, .4421915-019)
17	(.00000593, .00000555)	(.000000000, .000000000)	.03120	(.1491530-019, .1624846-018)
18	(.00000072, .00000093)	(.000000000, .000000000)	.03140	(.1252312-019, .9668072-020)
19	(-.00000003, .00000022)	(.000000000, .000000000)	.03180	(.2527275-019, .4097937-020)
20	(-.00000003, .00000002)	(.000000000, .000000000)	.03220	(.2643494-020, .3906075-020)
21	(-.00000001, .00000000)	(.000000000, .000000000)	.03260	(.1240309-020, .5614030-020)
22	(.00000000, .00000000)	(.000000000, .000000000)	.03920	(.1322677-020, .7987969-021)
23	(-.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1503874-020, .4076562-021)
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.2625888-021, .4808010-021)
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1438784-021, .4574495-021)
26	(.00000000, .00000000)	(.000000000, .000000000)	.03340	(.1859362-021, .9279011-022)
27	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1532491-021, .5404398-022)

TABLE 10 FOR Z=(6.0, -4.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-5.25591113, -5.89332304)	(.0000000000, .0000000000)	.02280	(.2605860-011, .2324015-011)		
2	(-6.06656933, 3.64311620)	(.0000000000, .0000000000)	.02320	(.4284242-012, .7134182-012)		
3	(1.33499720, 5.70812456)	(.0000000000, .0000000000)	.02360	(.3509769-012, .8208531-013)		
4	(4.35627918, .92481489)	(.0000000000, .0000000000)	.02400	(.1846697-013, .8698742-013)		
5	(2.11706633, -2.17366209)	(.0000000000, .0000000000)	.02460	(.6227672-014, .6055523-014)		
6	(-2.24146212, -1.80437365)	(.0000000000, .0000000000)	.02540	(.8559632-014, .1145454-014)		
7	(-7.8582322, -.54758954)	(.0000000000, .0000000000)	.03200	(.3951297-015, .5670344-015)		
8	(-4.3823300, .07353477)	(.0000000000, .0000000000)	.02660	(.1021860-015, .6089806-015)		
9	(-.11372629, .14398259)	(.0000000000, .0000000000)	.02720	(.5460516-016, .4313050-016)		
10	(.00267153, .06803883)	(.0000000000, .0000000000)	.02760	(.3104146-015, .1218837-016)		
11	(.01521625, .01714013)	(.0000000000, .0000000000)	.02820	(.7017923-017, .6230199-017)		
12	(.00694794, .00122131)	(.0000000000, .0000000000)	.02860	(.1910881-017, .1087085-016)		
13	(-.00176943, -.00093107)	(.0000000000, .0000000000)	.03540	(.9017669-018, .1713788-017)		
14	(-.00022674, -.00047556)	(.0000000000, .0000000000)	.02980	(.8335620-018, .3902479-018)		
15	(-.00002157, -.00012583)	(.0000000000, .0000000000)	.03020	(.8081723-018, .1661891-018)		
16	(-.00002184, -.00001970)	(.0000000000, .0000000000)	.03080	(.1045993-018, .1160010-018)		
17	(-.0000066, -.0000066)	(.0000000000, .0000000000)	.03100	(.3849810-019, .3658134-018)		
18	(-.00000111, .00000064)	(.0000000000, .0000000000)	.03140	(.2238999-019, .3914105-019)		
19	(-.00000313, -.0000022)	(.0000000000, .0000000000)	.03200	(.2428817-019, .1115367-019)		
20	(.00000311, .0000004)	(.0000000000, .0000000000)	.03840	(.2915193-019, .5515803-020)		
21	(.00000311, .0000001)	(.0000000000, .0000000000)	.03260	(.4126729-020, .4263869-020)		
22	(.00000300, .0000000)	(.0000000000, .0000000000)	.03300	(.1678029-020, .1062114-019)		
23	(.00000300, .0000000)	(.0000000000, .0000000000)	.03320	(.1051319-020, .2156591-020)		
24	(.00000300, .0000000)	(.0000000000, .0000000000)	.03300	(.1126837-020, .6284459-021)		
25	(.00000300, .0000000)	(.0000000000, .0000000000)	.03300	(.3310887-020, .3259027-021)		
26	(.00000300, .0000000)	(.0000000000, .0000000000)	.03900	(.3010955-021, .2546441-021)		
27	(.00000300, .0000000)	(.0000000000, .0000000000)	.03320	(.1230104-021, .4567547-021)		

TABLE 11 FOR Z=(-7.0, 3.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(.51305100, 2.80119635)	(.0000000001, .0000000000)	.02260	(.1804554-009, .3305118-010)		
2	(-2.4927835, .96906203)	(.0000000003, -.0000000001)	.02320	(.7443478-011, .1914738-010)		
3	(-1.51596930, -1.81762449)	(.0000000001, .0000000000)	.02340	(.2330368-011, .1943617-011)		
4	(.83092470, -1.81479963)	(.0000000000, .0000000000)	.02980	(.7709353-012, .3529807-012)		
5	(1.56728225, -2.7842675)	(.0000000000, .0000000000)	.02460	(.7074433-013, .3982263-012)		
6	(.91661818, .66810018)	(.0000000000, .0000000000)	.02520	(.2002667-013, .2747613-013)		
7	(.17490901, .67708470)	(.0000000000, .0000000000)	.02580	(.1665167-013, .4301569-014)		
8	(-.13077495, .34928124)	(.0000000000, .0000000000)	.02640	(.3392142-014, .1270102-014)		
9	(-.13838150, .10562076)	(.0000000000, .0000000000)	.02700	(.4694880-015, .6151418-015)		
10	(-.07152096, .00901523)	(.0000000000, .0000000000)	.02760	(.1281184-015, .1016408-014)		
11	(-.02492221, -.00987266)	(.0000000000, .0000000000)	.03440	(.5000162-016, .1262224-015)		
12	(-.00588622, -.00686908)	(.0000000000, .0000000000)	.02860	(.2779843-016, .2382088-016)		
13	(-.00065467, -.00271697)	(.0000000000, .0000000000)	.02900	(.3172490-016, .7644257-017)		
14	(.00017807, -.00077616)	(.0000000000, .0000000000)	.02960	(.1432647-016, .3286951-017)		
15	(.00013235, -.00016380)	(.0000000000, .0000000000)	.03000	(.2293802-017, .1853314-017)		
16	(.00004694, -.00002230)	(.0000000000, .0000000000)	.03040	(.7462984-018, .1570859-017)		
17	(.00001202, -.0000001)	(.0000000000, .0000000000)	.03080	(.3263421-018, .3254629-015)		
18	(.00000237, .00000111)	(.0000000000, .0000000000)	.03720	(.1799778-018, .3850519-018)		
19	(.00000035, .00000041)	(.0000000000, .0000000000)	.03180	(.1303086-018, .1095108-018)		
20	(.00000003, .00000010)	(.0000000000, .0000000000)	.03220	(.1675972-018, .4588775-019)		
21	(.00000000, .00000002)	(.0000000000, .0000000000)	.03240	(.1485826-018, .2425533-019)		
22	(.00000000, .00000000)	(.0000000000, .0000000000)	.03280	(.2384681-019, .1592072-019)		
23	(.00000000, .00000000)	(.0000000000, .0000000000)	.03320	(.8810223-020, .1414018-019)		
24	(.00000000, .00000000)	(.0000000000, .0000000000)	.03920	(.4343994-020, .3223414-019)		
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.2631837-020, .8890182-020)		
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03280	(.1980817-020, .2312512-020)		
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.2124561-020, .1008477-020)		

TABLE 12 FOR Z=(6.0, -6.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(-32.06801299, -42.90433829)	(.000000003, -0.000000052)	.02280	(.1269952-009, .9492608-010)		
2	(-41.34637555, -22.91969086)	(-.000000007, -0.000000180)	.02320	(.2199401-010, .3967649-010)		
3	(10.64599049, 36.76210869)	(-.000000029, -0.000000027)	.02340	(.1812016-010, .5247444-011)		
4	(28.28832055, -78435873)	(-.000000008, .000000000)	.02400	(.137711-011, .4968788-010)		
5	(2.68998456, -17.38032251)	(-.000000001, .000000001)	.02460	(.9773572-012, .4324351-012)		
6	(-7.39639841, -8.85964077)	(.000000000, .000000000)	.02520	(.1874420-012, .1564844-012)		
7	(-6.22674159, 1.12428332)	(.000000000, .000000000)	.02600	(.3935966-013, .2179899-012)		
8	(-1.17979744, 2.90677267)	(.000000000, .000000000)	.02660	(.3525340-013, .1430861-013)		
9	(.77798154, 1.17835032)	(.000000000, .000000000)	.02720	(.8723726-014, .5759661-014)		
10	(.57924423, .02772512)	(.000000000, .000000000)	.02780	(.1841120-014, .3846541-013)		
11	(-14121705, -16673465)	(.000000000, .000000000)	.02820	(.1144287-014, .6691615-015)		
12	(-0.01466015, -0.07450738)	(.000000000, .000000000)	.02880	(.1611922-014, .3172934-015)		
13	(-.02153459, -.01161241)	(.000000000, .000000000)	.02920	(.1552525-015, .2879075-015)		
14	(-.006683161, .00268887)	(.000001000, .000000000)	.02980	(.6697418-016, .1701688-015)		
15	(-.00068307, .00194531)	(.000000000, .000000000)	.03640	(.8913774-016, .3118513-016)		
16	(.00025721, .00047297)	(.000000000, .000000000)	.03080	(.2918797-016, .1649019-016)		
17	(.00013103, .0002851)	(.000000000, .000000000)	.03100	(.7379407-017, .3414209-016)		
18	(.0000270, -.00001853)	(.000000000, .000000000)	.03140	(.4590936-017, .6366303-017)		
19	(.00000030, -.00000701)	(.000000000, .000000000)	.03180	(.1739815-016, .1984210-017)		
20	(-.00000508, -.00000113)	(.000000000, .000000000)	.03220	(.1630552-017, .1414254-017)		
21	(-.00000030, -.0000001)	(.000000000, .000000000)	.03260	(.5919830-018, .1842109-016)		
22	(-.0000004, .00000004)	(.000000000, .000000000)	.03920	(.4744373-018, .4712974-018)		
23	(-.00000000, .0000001)	(.000000000, .000000000)	.03320	(.5375142-017, .1926710-018)		
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1500647-018, .1712202-018)		
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.6754278-019, .7211888-018)		
26	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.6583848-019, .5177867-019)		
27	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.1757008-016, .2525202-019)		

TABLE 13 FOR Z= (-8.0, -2.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(.92107273, -45000975)	(.000000024, .000000003)	.02260	(-1626120-008, .3328317-008)
2	(-29203215, -92552471)	(.000000062, .000000006)	.02300	(.1112978-008, .3511797-009)
3	(-94961437, -01988801)	(.000000013, -000000002)	.02340	(-7056099-010, .3369151-008)
4	(-37477421, .74390710)	(.000000003, -000000001)	.02360	(.3510325-010, .1768473-010)
5	(.42184873, -63185371)	(.000000000, .000000000)	.02440	(.5844699-011, .3902135-011)
6	(.68522751, .12352336)	(.000000000, .000000000)	.02520	(.6450312-012, .3578215-011)
7	(.50193431, -21562279)	(.000000000, .000000000)	.03200	(.1512800-012, .3521551-012)
8	(.23027450, -127198774)	(.000000000, .000000000)	.02640	(.5438352-013, .4604302-013)
9	(.05951739, -18798965)	(.000000000, .000000000)	.02700	(.3336730-013, .1056405-013)
10	(-.00471393, -.09459885)	(.000000000, .000000000)	.02740	(.6433419-013, .3205820-014)
11	(-.01490252, -.03736876)	(.000000000, .000000000)	.02800	(.2984604-014, .1195041-014)
12	(-.00983250, -.01180194)	(.000000000, .000000000)	.02840	(.6457145-015, .5379779-015)
13	(-.00440691, -.00289516)	(.000000000, .000000000)	.03540	(.1952192-015, .3014035-015)
14	(-.00162591, -.00047201)	(.000000000, .000000000)	.02960	(.7138184-016, .2458835-015)
15	(-.00049751, .00000131)	(.000000000, .000000000)	.03000	(.3006990-016, .1141160-013)
16	(-.00013046, .00003784)	(.000000000, .000000000)	.03040	(.1432201-016, .4938095-016)
17	(-.00002213, .00001935)	(.000000000, .000000000)	.03100	(.7698526-017, .1234750-016)
18	(-.00000562, .00000613)	(.000000000, .000000000)	.03140	(.4750889-017, .4352501-017)
19	(-.00000066, .00000167)	(.000000000, .000000000)	.03180	(.3568359-017, .1826194-017)
20	(-.00000038, .00000039)	(.000000000, .000000000)	.03820	(.4122682-017, .8652609-018)
21	(.00000000, .00000008)	(.000000000, .000000000)	.03240	(.7921238-017, .4532785-018)
22	(.00000000, .00000001)	(.000000000, .000000000)	.03280	(.7885538-018, .2607882-018)
23	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.2526031-018, .1655241-018)
24	(.00000000, .00000000)	(.000000000, .000000000)	.03320	(.1061359-018, .1182668-018)
25	(.00000000, .00000000)	(.000000000, .000000000)	.03300	(.5159085-019, .1007536-018)
26	(.00000000, .00000000)	(.000000000, .000000000)	.03900	(.2781337-019, .1266800-018)
27	(.00000000, .00000000)	(.000000000, .000000000)	.03260	(.1634922-019, .4078016-018)

TABLE 14 FOR Z=(7.0, 7.0)

N	JN	BESL.	EQ.	TIME	REL.	ERRCR
1	(46.79823538, 127.04731350)	(-.0000001841,	.0000018206)	.02280	(.1917642-007,	.7063687-008)
2	(-108.57072618, 54.86120542)	(-.0090003341,	.0000063006)	.02320	(.2153345-008,	.4261486-008)
3	(-62.14381335, -80.35247520)	(-.0000011987,	.0000010924)	.02360	(.9310683-009,	.7200790-009)
4	(47.5008953, -62.66491763)	(-.000003949,	-.0000000162)	.03020	(.2871054-009,	.2176300-009)
5	(53.47865501, 17.40058483)	(-.000000624,	-.0000000671)	.02460	(.5737505-010,	.1763355-009)
6	(3.12713792, 36.89486750)	(.000000007,	-.0000000202)	.02520	(.2111600-009,	.1789752-010)
7	(-19.17407832, 11.54318338)	(.000000031,	-.0000000029)	.02600	(.7102578-011,	.1179791-010)
8	(-10.75803347, -6.17760520)	(.000000009,	.0000000000)	.02660	(.2506344-011,	.4364690-011)
9	(-1809369, -6.30840822)	(.000000001,	.0000000001)	.02720	(.2836982-010,	.8136984-012)
10	(2.41459002, -1.70057248)	(.000000000,	.0000000000)	.02780	(.3897258-012,	.5533595-012)
11	(1.20096174, 42960464)	(.000000000,	.0000000000)	.03420	(.1385155-012,	.3972207-012)
12	(1.47722659, 48843990)	(.000000000,	.0000000000)	.02880	(.1921976-012,	.5813015-013)
13	(-1.11038719, 1.5447189)	(.000000000,	.0000000000)	.02920	(.4243808-013,	.3032668-013)
14	(-0.06585700, -0.0344124)	(.000000000,	.0000000000)	.02980	(.1135779-013,	.2173604-012)
15	(-0.01444432, -0.01587541)	(.000000000,	.0000000000)	.03020	(.80009986-014,	.7287923-014)
16	(.00088614, -.00650787)	(.000000000,	.0000000000)	.03080	(.1958366-013,	.266606-014)
17	(.00150105, -.00102519)	(.000000000,	.0000000000)	.03720	(.1584294-014,	.2464312-014)
18	(.0004963, .00014538)	(.000000000,	.0000000000)	.03160	(.7191383-015,	.2457531-014)
19	(.00005625, .00012149)	(.000000000,	.0000000000)	.03200	(.8656870-015,	.4043593-015)
20	(-.00001305, -.00003034)	(.000000000,	.0000000000)	.03220	(.5035684-015,	.2165962-015)
21	(-.00000234, .00000249)	(.000000000,	.0000000000)	.03260	(.1165505-015,	.3440987-015)
22	(-.00000152, -.00000084)	(.000000000,	.0000000000)	.03300	(.7146286-016,	.1286895-015)
23	(-.00000039, -.00000036)	(.000000000,	.0000000000)	.03320	(.1551326-015,	.3703590-016)
24	(.00000004, -.00000006)	(.000000000,	.0000000000)	.03940	(.3789553-016,	.2546579-016)
25	(.00000361, -.00000000)	(.000000000,	.0000000000)	.03300	(.1276200-016,	.8105061-016)
26	(.00000000, -.00000000)	(.000000000,	.0000000000)	.03300	(.9695893-017,	.1239037-016)
27	(.00000000, -.00000000)	(.000000000,	.0000000000)	.03300	(.5274267-016,	.4711326-017)

TABLE 15 FOR Z= (-9.0, -1.0)

N	IN		BESL. EQ.	TIME	REL. ERROR	
	UN	UN				
1	(.3687730,	- .14213813)	(.0000000417,	.0000000753)	.02300 (.4075269-006,	.2789796-006)
2	- .23264674,	- .24507589)	(.0000001062,	.0000001953)	.02320 (.4061819-007,	.3855723-007)
3	(- .25463902,	- .23838409)	(.0000000197,	.0000000481)	.02340 (.8399300-008,	.8973792-008)
4	(- .38292004,	- .06945546)	(.0000000032,	.0000000111)	.02400 (.1204489-008,	.6640558-008)
5	- .08830970,	- .26201132)	(.0000000904,	.0000000024)	.02460 (.1074873-008,	.3622806-009)
6	(.25404227,	- .20734848)	(.0000000000,	.0000000005)	.02520 (.7355434-010,	.9011839-010)
7	(.39255517,	- .04825872)	(.0000000000,	.000000001)	.02600 (.8979992-011,	.7304731-010)
8	- .34091753,	- .06617272)	(.0000000000,	.0000000000)	.02660 (.1872697-011,	.9648014-011)
9	(.21903312,	.09794396)	(.0000000000,	.0000000000)	.03340 (.5075756-012,	.1135123-011)
10	(.11331615,	.07924479)	(.0000000000,	.0000000000)	.02760 (.1645288-012,	.2352680-012)
11	- .04903264,	- .04836993)	(.0000000000,	.0000000000)	.02820 (.6148473-013,	.6232713-013)
12	(.01805704,	.02439579)	(.0000000000,	.0000000000)	.02880 (.2606663-013,	.1929375-013)
13	(.00567246,	.01060717)	(.0000000000,	.0000000000)	.02920 (.1252318-013,	.6697113-014)
14	- .00149352,	- .00407486)	(.0000000000,	.0000000000)	.02960 (.6946921-014,	.2546184-014)
15	(.00030377,	.00140559)	(.0000000000,	.0000000000)	.03640 (.4754367-014,	.1044412-014)
16	(.00003741,	.00044033)	(.0000000000,	.0000000000)	.03060 (.5384293-014,	.4574215-015)
17	- .00000055,	- .00012633)	(.0000000000,	.0000000000)	.03120 (.4830982-014,	.2123152-015)
18	(- .00000075,	.00003340)	(.0000000000,	.0000000000)	.03140 (.6039028-015,	.1038716-015)
19	(- .00000248,	.00000018)	(.0000000000,	.0000000000)	.03180 (.1756386-015,	.5335233-016)
20	- .00000003,	- .00000186)	(.0000000000,	.0000000000)	.03220 (.6460852-016,	.2869361-016)
21	(- .00000024,	.00000039)	(.0000000000,	.0000000000)	.03260 (.2693239-016,	.1613361-016)
22	(- .00000006,	.00000008)	(.0000000000,	.0000000000)	.03900 (.1220651-016,	.9481234-017)
23	- .00000001,	- .00000001)	(.0000000000,	.0000000000)	.03320 (.5892149-017,	.5930552-017)
24	(.00000000,	.00000000)	(.0000000000,	.0000000000)	.03320 (.2992897-017,	.3764496-017)
25	(.00000000,	.00000000)	(.0000000000,	.0000000000)	.03300 (.1587362-017,	.2569093-017)
26	- .00000000,	- .00000000)	(.0000000000,	.0000000000)	.03300 (.8743930-018,	.1877670-017)
27	(.00000000,	.00000000)	(.0000000000,	.0000000000)	.03300 (.4983292-018,	.1510244-017)

TABLE 16 FOR ZA(-8.0, -8.0)

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(336.94890561, -75.95002010)	(-0.0000686669, -0.0002975568)	.02360	(.2852010-006, .1265282-005)	
2	{ -38.27182079, -312.17128893)	{ -0.0000697569, -0.0010071152)	.02320	{ .7475794-006, .9165233-007)	
3	(-268.47403000, -11.66076305)	(-0.0002219538, -0.0001965876)	.02360	(.3014249-007, .6939921-006)	
4	(-58.03315569, 207.12073798)	(-0.0000824400, .0000044115)	.02400	(.3756306-007, .1052479-007)	
5	{ -135.89708542, 86.20455380)	{ -0.0000147050, .0000161755)	.02460	{ .4124576-008, .6502184-008)	
6	{ 89.09096884, -68.30721285)	{ -0.000002353, .0000055144)	.03140	{ .1547401-008, .2018227-008)	
7	{ -17.84843547, -70.61672208)	{ .0000009773, .0000009049)	.02580	{ .1820540-008, .4601430-009)	
8	{ 4. -42.91875767, -9.09980000)	{ .0000003077, -0.000000107)	.02660	{ .1713122-009, .8079854-009)	
9	{ -15.97050.10, 18.59818441)	{ .0000000467, -0.0000000498)	.02720	{ .1001656-009, .8601346-010)	
10	{ 4.02890024, 12.05594250)	{ -0.000000004, -0.000000146)	.02780	{ .8318685-010, .2780014-010)	
11	{ -5.93676.62, -1.50795027)	{ -0.000000022, -0.000000021)	.02820	{ .1140550-010, .4490329-010)	
12	{ 2.06067650, -1.81943752)	{ -0.000000006, .0000000000)	.02860	{ .6409621-011, .7259472-011)	
13	{ -1.1660559, -1.14609181)	{ -0.000000001, .0000000001)	.03520	{ .2135805-010, .2173084-011)	
14	{ -38770720, -2.33245224)	{ -0.000000000, .0000000000)	.02950	{ .1172026-011, .1955129-011)	
15	{ -.15519231, .06070657)	{ .000000000, .0000000000)	.03020	{ .5176815-012, .1323423-011)	
16	{ -.01704143, .05529054)	{ .000000000, .0000000000)	.03060	{ .8080500-012, .2490832-012)	
17	{ .01052.30, -.01578765)	{ .000000000, .0000000000)	.03100	{ .2177082-012, .1451355-012)	
18	{ .00586.01, .00062356)	{ .000000000, .0000000000)	.03140	{ .6319752-013, .5939137-012)	
19	{ .00125715, -.00119963)	{ .000000000, .0000000000)	.03180	{ .4628945-013, .4850897-013)	
20	{ -.00002314, -.00048694)	{ .000000000, .0000000000)	.03840	{ .3539688-012, .1827115-013)	
21	{ -.00010234, -.00008056)	{ .000000000, .0000000000)	.03260	{ .1290446-013, .1644034-013)	
22	{ -.00003281, .00000605)	{ .000000000, .0000000000)	.03300	{ .5855269-014, .3173569-013)	
23	{ -.000000124, -.00000698)	{ .000000000, .0000000000)	.03320	{ .6411029-014, .3891299-014)	
24	{ .00000055, .00000184)	{ .000000000, .0000000000)	.03330	{ .6773957-014, .2041893-014)	
25	{ .00000039, .0000019)	{ .000000000, .0000000000)	.03300	{ .1292889-014, .2719831-014)	
26	{ -.00000009, -.00000004)	{ .000000000, .0000000000)	.03960	{ .7646560-015, .1876381-014)	
27	{ .00000001, -.00000002)	{ .000000000, .0000000000)	.03300	{ .1248838-014, .4648287-015)	

TABLE 17 FOR Z=(9.0, 9.0)

N	IN	BESL.	EQ.	TIME	REL. ERROR
1	(633.81320374, -621.22017556)	(-.0091614383,	.0270374154)	.02280	(.9356040-005, .9545701-005)
2	(620.63016019, 530.64875963)	(-.0077568972,	.0884860869)	.02340	(.3200327-005, .3743003-005)
3	(-377.97299388, 601.22475567)	(-.0222716973,	.0190984212)	.02340	(.1672107-005, .1051206-005)
4	(-546.21290016, -204.24931825)	(-.0091672422,	-.0006208584)	.02400	(.3505478-006, .9377183-006)
5	(44.43418325, -449.24089960)	(-.0018151484,	-.0020479703)	.02460	(.1246868-005, .1233271-006)
6	(321.32027351, -70.01461944)	(.0000419079,	-.00007760730)	.02520	(.4770890-007, .2189519-006)
7	(123.10291158, 188.35096809)	(-.0001562593,	-.0001417527)	.02580	(.3302064-007, .2158177-007)
8	(-79.07838710, 120.76310681)	(.0000548027,	.0000024178)	.02660	(.1308530-007, .8568544-008)
9	(-86.04980514, -10.71410258)	(.0000092825,	.0000100596)	.02720	(.2943375-008, .2363957-007)
10	(-17.68554486, -45.42739995)	(-.00000001206,	.00000032813)	.02760	(.3375521-008, .1314139-008)
11	(15.92431522, -20.11018084)	(-.00000005540,	.00000005179)	.03420	(.8520556-009, .6747031-009)
12	(12.56948103, 1.38523810)	(-.00000001688,	-.00000000053)	.02880	(.2368867-009, .2149482-008)
13	(2.68196475, 5.19784914)	(-.0000000249,	-.0000000254)	.02920	(.2355093-009, .1215180-009)
14	(-1.18756459, 2.24878824)	(.0000000002,	-.0000000075)	.02980	(.1091930-009, .5766094-010)
15	(-1.03109906, .14749527)	(.0000000011,	-.0000000010)	.03000	(.2500964-010, .1748355-009)
16	(-.28516441, -.28446436)	(.0000000003,	.0000000000)	.03060	(.1743894-010, .1748210-010)
17	(.01841653, -.14624363)	(.0000000000,	.0000000000)	.03100	(.5053750-010, .6364921-011)
18	(.04372109, -.02656427)	(.0000000000,	.0000000000)	.03140	(.3871137-011, .6371352-011)
19	(.01589505, .00567293)	(.0000000000,	.0000000000)	.03180	(.1882316-011, .5274088-011)
20	(.00181131, .00498423)	(.0000000000,	.0000000000)	.03860	(.2841113-011, .1032482-011)
21	(-.00079386, .00137801)	(.0000000000,	.0000000000)	.03260	(.1085621-011, .6254187-012)
22	(-.00044829, .00008348)	(.0000000000,	.0000000000)	.03300	(.3137089-012, .1684537-011)
23	(-.00009769, -.00007812)	(.0000000000,	.0000000000)	.03300	(.2285790-012, .2864255-012)
24	(-.00000149, -.000003296)	(.0000000000,	.0000000000)	.03920	(.2328190-011, .1053556-012)
25	(.00003100, -.00000581)	(.0000000000,	.0000000000)	.03300	(.8765441-013, .9057725-013)
26	(.00000203, .00000015)	(.0000000000,	.0000000000)	.03300	(.3836873-013, .5208070-012)
27	(.00000029, .00000038)	(.0000000000,	.0000000000)	.03320	(.3851584-013, .2981417-013)

TABLE 18. EDR ZEL 19.0. -1.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(.05220553, .29346758)	(.0000036026, -0.0000027811)	.02300	(.2913733-004, .5183278-005)		
2	{ .38622072, .01272424)	{ .0000093286, -0.0000071817)	.02320	{ .1041588-005, .3161621-004)		
3	(.10025559, -.27313210)	(.0000022248, -0.0000020915)	.02340	(.1008195-005, .3700579-006)		
4	{ -.31044774, -.16902532)	{ .0000004943, -.0000005662)	.02380	{ .7790500-007, .1430876-006)		
5	{ -.33327611, .114666073)	{ .0000001021, -.0000001434)	.02440	{ .1660066-007, .4817782-007)		
6	{ -.03037125, .24960385)	{ .0000000195, -.0000000342)	.02520	{ .3973371-007, .4635189-008)		
7	{ .26702212, .17828948)	{ .000000034, -.000000077)	.02600	{ .9463250-009, .1417289-008)		
8	{ .37578712, .03454275)	{ .000000005, -.000000016)	.02640	{ .1351551-009, .1470340-008)		
9	{ .32281433, -.06403757)	{ .000000001, -.000000003)	.03340	{ .3040735-010, .1532842-009)		
10	{ .21093531, -.09113774)	{ .000000000, -.000000001)	.02780	{ .8660492-011, .2004476-010)		
11	{ .11293217, -.07466313)	{ .000000000, -.000000000)	.02840	{ .2903032-011, .4391021-011)		
12	{ .05131000, -.04689561)	{ .000000000, .000000000)	.02880	{ .1106997-011, .1211357-011)		
13	{ .02015117, -.02457794)	{ .000000000, .000000000)	.02920	{ .4721866-012, .3871404-012)		
14	{ .00688100, -.01118689)	{ .000000000, .000000000)	.02980	{ .2240260-012, .1378712-012)		
15	{ .00203442, -.00452661)	{ .000000000, .000000000)	.03620	{ .1189314-012, .5350456-013)		
16	{ .00050051, -.00165360)	{ .000000000, .000000000)	.03080	{ .7250890-013, .2230235-013)		
17	{ .00009266, -.00055137)	{ .000000000, .000000000)	.03120	{ .5508482-013, .9385308-014)		
18	{ .00001557, -.00016919)	{ .000000000, .000000000)	.03140	{ .7762020-013, .4625209-014)		
19	{ -.00000471, -.00004808)	{ .000000000, .000000000)	.03180	{ .4031889-013, .2271927-014)		
20	{ -.00000219, -.00001271)	{ .000000000, .000000000)	.03220	{ .6786503-014, .1166755-014)		
21	{ -.00000091, -.00000314)	{ .000000000, .000000000)	.03260	{ .2149929-014, .6245094-015)		
22	{ -.00000030, -.00000073)	{ .000000000, .000000000)	.03920	{ .8364933-015, .3476188-015)		
23	{ -.00000032, -.00000016)	{ .000000000, .000000000)	.03320	{ .3644102-015, .2009337-015)		
24	{ -.00000022, -.0000003)	{ .000000000, .000000000)	.03300	{ .1713544-015, .1205379-015)		
25	{ -.00000001, -.0000001)	{ .000000000, .000000000)	.03320	{ .8535989-016, .7506864-016)		
26	{ -.00000000, -.0000000)	{ .000000000, .000000000)	.03300	{ .4455163-016, .4860987-016)		
27	{ .00000000, .00000000)	{ .000000000, .000000000)	.03300	{ .2418791-016, .3283560-016)		

TABLE 19 FOR Z=(9.0, 2.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(.8534274, -46597136)	(.0000000747, -00000001499)	.02260	(.8660826-007, .1595925-006)
2	(.59193100, .71707782)	(.00000002006, -.00000003909)	.02320	{ .3042684-007, .2516120-007}
3	(-.54030817, .71386493)	(.0000000667, -.00000000807)	.02340	(.7700995-008, .5825472-008)
4	(-.8326408, -.18732718)	(.0000000186, -.0000000146)	.02380	(.1092908-008, .4873113-008)
5	(-.20277123, -.71531589)	(.0000000046, -.0000000022)	.02460	{ .9433172-009, .2674030-009}
6	(.45225551, -.52235523)	(.0000000010, -.0000000002)	.03100	{ .8476799-010, .7339218-010}
7	(.62991323, -.07607820)	(.0000000002, .0000000000)	.02580	{ .1168970-010, .9678850-010}
8	(.45643716, .20207966)	(.0000000000, .0000000000)	.02540	{ .2974695-011, .6718941-011}
9	(.21942208, .24658976)	(.0000000000, .0000000000)	.02700	{ .1097108-011, .9762353-012)
10	(.06619351, .17495970)	(.0000000000, .0000000000)	.02760	{ .6209117-012, .2349131-012)
11	(.00308640, .99276324)	(.0000000000, .0000000000)	.02800	{ .2192376-011, .7294420-013)
12	(-.01098541, .03952643)	(.0000000000, .0000000000)	.02840	{ .9791112-013, .2721201-013)
13	(-.00808145, .01388391)	(.0000000000, .0000000000)	.02900	{ .1903769-013, .1190405-013)
14	(-.00442042, .00400616)	(.0000000000, .0000000000)	.02960	{ .5559817-014, .6134736-014)
15	(-.0078445, .00090545)	(.0000000000, .0000000000)	.03000	{ .1984035-014, .3910094-014)
16	(-.00060869, .00012960)	(.0000000000, .0000000000)	.03040	{ .8125036-015, .3816041-014)
17	(-.00018034, -.00000803)	(.0000000000, .0000000000)	.03080	{ .3718097-015, .8347956-014)
18	(-.00004697, -.00001424)	(.0000000000, .0000000000)	.03120	{ .1880096-015, .6200836-015)
19	(-.05030177, -.00000647)	(.0000000000, .0000000000)	.03780	{ .1049770-015, .1748676-015)
20	(-.00000215, -.00000215)	(.0000000000, .0000000000)	.03200	{ .6546671-016, .6566027-016)
21	(-.00000038, -.00000060)	(.0000000000, .0000000000)	.03260	{ .4722109-016, .2870075-016)
22	(-.00000005, -.00000014)	(.0000000000, .0000000000)	.03280	{ .4392606-016, .1395126-016)
23	(-.00000000, -.0000003)	(.0000000000, .0000000000)	.03300	{ .1042761-015, .7391845-017)
24	(.00000000, -.00000001)	(.0000000000, .0000000000)	.03300	{ .2550877-016, .4231982-017)
25	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	{ .6215591-017, .2614708-017)
26	(.00000000, .00000000)	(.0000000000, .0000000000)	.03900	{ .2402046-017, .1754221-017)
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03280	{ .1115230-017, .1301403-017)

TABLE 20 FOR $2\pi(8.0, -3.0)$

N	JN	BESL.	EQ.	TIME	REL.	ERROR
1	(2.47792513, -1.09173697)	(- .0000000044,	.0000000077)	.02280	(.2092197-008,	.4748677-008)
2	(- .62942479, -2.48071242)	(- .0000000111,	.0000000214)	.02320	(.1851930-008,	.4698855-009)
3	(-2.34604903, -.09916570)	(- .0000000007,	.0000000053)	.02360	(.1061287-009,	.2510779-008)
4	(-.88873998, 1.83702974)	(.0000000003,	.0000000011)	.03020	(.5699172-010,	.2757185-010)
5	(- .96293264, -4.41752679)	(.0000000001,	.0000000002)	.02460	(.1021398-010,	.6938404-011)
6	(1.36145437, .11215002)	(.0000000000,	.0000000000)	.02520	(.1341811-011,	.1628902-010)
7	(.77216624, -.59863968)	(.0000000000,	.0000000000)	.02600	(.4211180-012,	.5431867-012)
8	(-16766138, -.58635087)	(.0000000000,	.0000000000)	.02660	(.3314147-012,	.9476511-013)
9	(-.09263800, -.31923897)	(.0000000000,	.0000000000)	.02720	(.9855417-013,	.2859883-013)
10	(-.11425047, -.11190753)	(.0000000000,	.0000000000)	.02780	(.1264369-013,	.1290840-013)
11	(-.06579523, -.01994230)	(.0000000000,	.0000000000)	.03460	(.3349739-014,	.1105172-013)
12	(-.02634903, .00434139)	(.0000000000,	.0000000000)	.02880	(.1232180-014,	.7478418-014)
13	(-.00778836, .00537267)	(.0000000000,	.0000000000)	.02920	(.5936186-015,	.8605155-015)
14	(-.00158283, -.00264532)	(.0000000000,	.0000000000)	.02960	(.4025032-015,	.2408468-015)
15	(-.00011272, .00092307)	(.0000000000,	.0000000000)	.03020	(.7545632-015,	.9214398-016)
16	(.00007477, .00025045)	(.0000000000,	.0000000000)	.03060	(.1482571-015,	.4396367-016)
17	(-.00004531, -.00005290)	(.0000000000,	.0000000000)	.03700	(.3158105-016,	.2615430-016)
18	(.00001105, .00000785)	(.0000000000,	.0000000000)	.03160	(.1122173-016,	.2150526-016)
19	(.00000394, .00000034)	(.0000000000,	.0000000000)	.03200	(.5082218-017,	.5818837-016)
20	(-.00000073, -.00000026)	(.0000000000,	.0000000000)	.03220	(.2774467-017,	.9872933-017)
21	(.00000014, -.00000012)	(.0000000000,	.0000000000)	.03260	(.1841657-017,	.2230784-017)
22	(.00000002, -.00000003)	(.0000000000,	.0000000000)	.03300	(.1637287-017,	.8864632-018)
23	(-.00000000, -.00000001)	(.0000000000,	.0000000000)	.03320	(.3839669-017,	.4100058-018)
24	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03940	(.9510888-018,	.2591789-018)
25	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03300	(.2425496-018,	.1822715-018)
26	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03320	(.1013003-018,	.1654159-018)
27	(.00000000, .00000000)	(.0000000000,	.0000000000)	.03320	(.5284884-0-9,	.3006966-0-9)

TABLE 21 FOR Z=1, 8.0, 4.0

N	UN	BESL. EQ.	TIME	REL. ERROR
1	(6.68116975, 2.57549712)	(-.0000000162, .0000000457)	.02280	(.3852680-008, .9994345-008)
2	(-1.39912000, -6.53156461)	(-.0000000499, .0000001274)	.02300	(.4330318-008, .9275975-009)
3	(-5.93450701, -31695407)	(-.0000000234, .0000000213)	.02340	(.2282849-009, .4274305-008)
4	(-2.06649131, -4.56104007)	(-.0000000067, .0000000019)	.02360	(.1396124-009, .6325482-010)
5	(-2.45689794, -3.13918959)	(-.0000000014, -.0000000033)	.02440	(.2387056-010, .1868238-010)
6	(2.95379445, .19340150)	(-.0000000002, -.000000002)	.02500	(.3860617-011, .5896267-010)
7	(1.20369630, 1.59899473)	(-.00000000, .00000000)	.02580	(.1765321-011, .1328904-011)
8	(-14932332, -1.20260370)	(-.00000000, .00000000)	.03240	(.2545588-011, .3160772-012)
9	(-.48053065, .44462985)	(-.00000000, .00000000)	.02700	(.1360618-012, .1470479-012)
10	(-.31546493, .03020761)	(.00000000, .00000000)	.02740	(.3432871-013, .3585025-012)
11	(-12019170, -.06874965)	(.00000000, .00000000)	.02820	(.1439100-013, .2515910-013)
12	(-.02458138, -.04924596)	(.00000000, .00000000)	.02860	(.1085116-013, .5416415-014)
13	(.00210124, -.01994301)	(.00000000, .00000000)	.02920	(.1892347-013, .1993819-014)
14	(-.004118C9, -.00533747)	(.00000000, .00000000)	.02960	(.1392742-014, .1074717-014)
15	(.001958C3, -.00076807)	(.00000000, .00000000)	.03620	(.4092994-015, .0437442-014)
16	(.00060511, .00009530)	(.00000000, .00000000)	.03060	(.1795406-015, .1139964-014)
17	(.00013C20, .00010487)	(.00000000, .00000000)	.03100	(.1097581-015, .1362684-015)
18	(.00001583, .00003991)	(.00000000, .00000000)	.03140	(.1153545-015, .4574873-016)
19	(-.00000137, .00001032)	(.00000000, .00000000)	.03160	(.1654359-015, .2197095-016)
20	(-.00000142, -.00000192)	(.00000000, .00000000)	.03220	(.1926093-016, .1424888-016)
21	(-.00000047, .00000022)	(.00000000, .00000000)	.03260	(.6801810-017, .1471515-016)
22	(-.00000011, -.0000001)	(.00000000, .00000000)	.03900	(.3411025-017, .5283898-016)
23	(-.00000032, -.0000001)	(.00000000, .00000000)	.03300	(.2260423-017, .3614024-017)
24	(.00000000, .0000000)	(.00000000, .00000000)	.03300	(.2214227-017, .1267789-017)
25	(.00000000, .0000000)	(.00000000, .00000000)	.03280	(.2114927-016, .6435027-018)
26	(.00000000, -.0000000)	(.00000000, .00000000)	.03300	(.8665028-018, .4262433-018)
27	(.00000000, .0000000)	(.00000000, .00000000)	.03280	(.2855340-018, .39333916-018)

TABLE 22 FOR Z=1, 8.0, -5.0

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(17.91076513, -6.02381185)	(.0000002598,	.0000002331)	.02280	(.9284352-008, .2760542-007)
2	(-3.15625591, -17.14816892)	(.0000007750,	.0000006825)	.02320	(.1307992-007, .2407462-008)
3	(-15.19207811, -85.109290)	(.0000002488,	.0000000423)	.02360	(.6409069-009, .1144024-007)
4	(-4.75033917, 11.56822732)	(.000000542,	-.0000000220)	.02400	(.4603978-009, .1890563-009)
5	(6.57690059, -7.03483427)	(.0000000076,	-.0000000104)	.02460	(.7129826-010, .665709-010)
6	(6.71000583, -1.54989282)	(.0000000002,	-.0000000027)	.03160	(.1433225-010, .6204913-010)
7	(1.70573005, -4.18302933)	(-.0000000003,	-.0000000005)	.02580	(.1108105-010, .4518562-011)
8	(-1.27344004, -2.37255864)	(-.0000000091,	-.000000001)	.02660	(.2800500-011, .1503139-011)
9	(-1.40456605, -.37386043)	(.000000000,	.000000000)	.02720	(.4606442-012, .1730506-011)
10	(-.62104915, .34731317)	(.000000000,	.000000000)	.02760	(.1820049-012, .3254526-012)
11	(-.10216633, -.30043564)	(.000000000,	.000000000)	.02840	(.1863838-012, .6338180-013)
12	(.04768742, .12053375)	(.000000000,	.000000000)	.02880	(.6495000-013, .2569652-013)
13	(.04252514, .02388988)	(.000000000,	.000000000)	.03540	(.1145199-013, .2038510-013)
14	(-.01680180, -.00258585)	(.000000000,	.000000000)	.02960	(.4410348-014, .2865674-013)
15	(.00383020, -.00396820)	(.000000000,	.000000000)	.03020	(.2851752-014, .2752655-014)
16	(.00021503, -.00165934)	(.000000000,	.000000000)	.03050	(.7261068-014, .9409379-015)
17	(-.00022271, -.00041817)	(.000000000,	.000000000)	.03120	(.9470865-015, .5180052-015)
18	(-.00011529, -.00005552)	(.000000000,	.000000000)	.03140	(.2532442-015, .5258223-015)
19	(-.00003203, .00000537)	(.000000000,	.000000000)	.03780	(.1194242-015, .7128171-015)
20	(-.000000558, -.00000547)	(.000000000,	.000000000)	.03240	(.8733595-016, .8913755-016)
21	(-.00000034, .00000176)	(.000000000,	.000000000)	.03260	(.1780025-015, .3446206-016)
22	(.00000016, .00000036)	(.000000000,	.000000000)	.03300	(.4716973-016, .2044359-016)
23	(-.00000007, .00000004)	(.000000000,	.000000000)	.03320	(.1256880-016, .1981619-016)
24	(.00000002, .0000000)	(.000000000,	.000000000)	.03320	(.6123554-017, .2171418-015)
25	(.00000000, .0000000)	(.000000000,	.000000000)	.03300	(.4411507-017, .6194498-017)
26	(.00000000, .0000000)	(.000000000,	.000000000)	.03920	(.6028485-017, .2295047-017)
27	(.00000000, .0000000)	(.000000000,	.000000000)	.03300	(.5899470-017, .1333187-017)

TABLE 23 FOR Z=(6.0, 8.0)

N	JN	BESL.	EQ.	TIME	REL.	ERROR	
1	(-200.05811067, 305.03937839)	(.0000015543,	.0000016885)	.02280	(.6388287-008,	.4189717-008)	
2	(-285.90905095, -149.98342054)	(.0000067824,	.0000060991)	.02300	(.1176330-008,	.2242404-008)	
3	(83.44524216, -249.54450038)	(-0.000001949,	.0000023650)	.02340	(-1.007617-008,	.3369372-009)	
4	(196.16798326, 20.09368418)	(-0.000004936,	.0000003141)	.03000	(-1.020515-009,	.9962955-009)	
5	(23.57534012, 133.64195759)	(-0.000001285,	-.0000000478)	.02460	(.1929909-009,	.3404491-010)	
6	(-75.10921072, 41.23121108)	(-0.000000088,	-.0000000293)	.02520	(.1316873-010,	.2398894-010)	
7	(-38.07201820, -31.85064332)	(.0000000039,	-.0000000053)	.02580	(.5412403-011,	.6469605-011)	
8	(7.45599491, -25.34509108)	(.0000000013,	.0000000000)	.02620	(.5527394-011,	.1626043-011)	
9	(12.78805073,	-2.02431760)	(.000000002,	.0000000002)	.02700	(.6197522-012,	.3915110-011)
10	(3.44008501, 4.74402637)	(.000000000,	.000000000)	.02760	(.4266377-012,	.3093726-012)	
11	(-1.06950772, 2.21300684)	(.000000000,	.000000000)	.03400	(.2450513-012,	.184290-012)	
12	(-95694717, .05947624)	(.000000000,	.000000000)	.02860	(.4721988-013,	.7597476-012)	
13	(-19430181, -29002248)	(.000000000,	.000000000)	.02900	(.3876009-013,	.2596749-013)	
14	(.05058258, -10776355)	(.000000000,	.000000000)	.02960	(.2401092-013,	.1127192-013)	
15	(.03790156, -0.00434092)	(.000000000,	.000000000)	.03020	(.5007585-014,	.4372279-013)	
16	(.007211573,	.00898518)	(.000000000,	.000000000)	.03060	(.3985341-014,	.3200510-014)
17	(-0.01012569,	.00312019)	(.000000000,	.000000000)	.03720	(.4044231-014,	.1355364-014)
18	(-0.00086272,	.00022427)	(.000000000,	.000000000)	.03140	(.7008470-015,	.2693794-014)
19	(-0.00117037,	-.00015315)	(.000000000,	.000000000)	.03180	(.4925137-015,	.5478718-015)
20	(.00000799,	-.00005554)	(.000000000,	.000000000)	.03200	(.1419079-014,	.2041467-015)
21	(.00001181,	-.00000572)	(.000000000,	.000000000)	.03240	(.1263727-015,	.2608485-015)
22	(.00000254,	.00000146)	(.000000000,	.000000000)	.03280	(.7522071-016,	.1309106-015)
23	(.000000005,	.00000063)	(.000000000,	.000000000)	.03300	(.4750943-015,	.3818866-016)
24	(-0.0000010,	.00000008)	(.000000000,	.000000000)	.03920	(.2917047-016,	.3569443-016)
25	(-.00000002,	-.00000001)	(.000000000,	.000000000)	.03300	(.1415563-016,	.4963272-016)
26	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300	(.2550355-016,	.8807838-017)
27	(.00000000,	.00000000)	(.000000000,	.000000000)	.03300	(.8816154-017,	.6368827-017)

TABLE 24 FOR $2s(5.0, -8.0)$

N	JN	BESL.	EQ.	TIME	REL. ERROR
1	(-373.83648469, -11.77559129)	(-0000001445, .0000001643)	.02280	(-4448197-009, .1412157-007)	
2	(-40.11033553, -323.14293509)	(-00000006837, .00000007161)	.02320	(-1029250-008, -1277563-009)	
3	(248.63670227, 69.97028750)	(.0000000588, .0000002360)	.02340	(.3916038-010, .1391549-009)	
4	(86.18367567, -165.46124594)	(.0000000538, .0000000177)	.02400	(.2537657-010, .1321787-010)	
5	(-90.91909015, -82.36011441)	(.0000000997, -0000000080)	.02460	(-5157569-011, -5693551-011)	
6	(-63.23025718, 37.46648670)	(-0000000003, -0000000026)	.02520	(.1520941-011, .2566814-011)	
7	(7.87866946, 39.41499657)	(-0000000005, -000000002)	.02600	(.2399044-011, .4795453-012)	
8	(19.82606802, -3.44880249)	(-0000000001, -0000000011)	.03280	(-1798786-012, -1034065-011)	
9	(4.98244062, -7.80105252)	(.0000000000, .0000000000)	.02720	(.1298571-012, .8293820-013)	
10	(-2.16571515, -3.27603033)	(.0000000000, .0000000000)	.02760	(.5219238-013, .3150334-013)	
11	(-1.526333903, -22669368)	(.0000000000, -0000000000)	.02820	(-1247570-013, -83999348-013)	
12	(-1.16906147, .53783512)	(.0000000000, .0000000000)	.02880	(.1832054-013, .5758825-014)	
13	(.13811751, .13376039)	(.0000000000, .0000000000)	.02920	(.3525965-014, .36408820-014)	
14	(-0.05819761, -0.01966329)	(-0000000000, -0000000000)	.02980	(-1273283-014, -3768547-014)	
15	(.00291891, -0.01821652)	(.0000000000, .0000000000)	.03640	(.3742180-014, .5996251-015)	
16	(-0.00415.31, -0.00316749)	(.0000000000, .0000000000)	.03060	(.3757808-015, .4929245-015)	
17	(-0.00127742, -0.00057094)	(-0000000000, -0000000000)	.03120	(-1695704-015, -3793934-015)	
18	(-0.00003000, .00035405)	(.0000000000, .0000000000)	.03160	(.9730814-015, .8245522-016)	
19	(.00007106, .00004803)	(.0000000000, .0000000000)	.03180	(.5382936-016, .7964445-016)	
20	(-0.0001735, -0.0000880)	(-0000000000, -0000000000)	.03220	(-.2762365-016, -5543248-016)	
21	(.00000024, -0.0000432)	(.0000000000, .0000000000)	.03860	(.2514734-015, .1400024-016)	
22	(-0.0000076, -0.0000050)	(.0000000000, .0000000000)	.03280	(.9604841-017, .1476051-016)	
23	(-.000000016, -.00000008)	(-.0000000000, -.0000000000)	.03320	(-.5290333-017, -.1042216-016)	
24	(.00000000, .00000004)	(.0000000000, .0000000000)	.03300	(.4921983-016, .2814212-017)	
25	(.00000001, .00000000)	(.0000000000, .0000000000)	.03320	(-.2039874-017, .3071285-017)	
26	(-.00000000, .00000000)	(-.0000000000, -.0000000000)	.03300	(.1159749-017, -.2380969-017)	
27	(.00000000, .00000000)	(.0000000000, .0000000000)	.03300	(.8129326-017, .6506281-018)	

TABLE 25 FOR Z=(B.0. 6.0)

N	UN	BESL. EQ.	TIME	REL. ERROR
1	(47.77790403, 14.03828260)	(-0.0000025128, 0.0000017054)	.02280	(.2674937-007, .9103882-007)
2	(-7.19836507, 45.04135623)	(-0.000076044, 0.0000055279)	.02300	(.4672219-007, .7466990-008)
3	(-39.27145538, 2.10255909)	(-0.000024365, -0.0000000210)	.02340	(.2141017-008, .3998976-007)
4	(-10.89501225, -29.89440392)	(-0.000004779, -0.000003610)	.02360	(.1837469-008, .6696654-009)
5	(12.94933385, -16.00537172)	(-0.000000393, -0.000001344)	.02440	(.2534818-009, .2842689-009)
6	(15.65125614, 6.32050636)	(-0.000000109, -0.000000293)	.02520	(.6319577-010, .1564896-009)
7	(1.62663683, 10.80415341)	(-0.000000056, -0.000000036)	.02580	(.1266792-009, .1907240-010)
8	(-4.75393403, -4.41377052)	(-0.000000014, -0.00000001)	.02640	(.86669077-011, .9337191-011)
9	(-3.47445269, -5.9075047)	(-0.000000002, -0.000000002)	.02700	(.2281058-011, .1341586-010)
10	(-88728836, -11.51204229)	(-0.00000000, -0.00000000)	.02760	(.1654109-011, .9706551-012)
11	(-24034657, -26377116)	(-0.00000000, -0.00000000)	.02800	(.1090470-011, .3431449-012)
12	(.30210983, -1.14944450)	(-0.00000000, -0.00000000)	.02860	(.1495712-012, .3023660-012)
13	(.12451022, .04179957)	(-0.00000000, -0.00000000)	.03520	(.6048625-013, .1801731-012)
14	(-02207875, -04215166)	(-0.00000000, -0.00000000)	.02960	(.5501683-013, .2881743-013)
15	(-.00423903, .01552787)	(-0.00000000, -0.00000000)	.03000	(.4477373-013, .1222301-013)
16	(-.00430226, .00274548)	(-0.00000000, -0.00000000)	.03040	(.6684200-014, .1047438-013)
17	(-.00150344, -.0023911)	(-0.00000000, -0.00000000)	.03080	(.2812883-014, .1768637-013)
18	(-.00027498, -.00032884)	(-0.00000000, -0.00000000)	.03120	(.2197870-014, .1837170-014)
19	(.00000149, -.00011423)	(-0.00000000, -0.00000000)	.03780	(.5625624-013, .7345732-015)
20	(-.000001897, -.00002181)	(-0.00000000, -0.00000000)	.03200	(.5976948-015, .5199223-015)
21	(.00000087, -.00000109)	(-0.00000000, -0.00000000)	.03240	(.2170238-015, .1366110-014)
22	(.00000138, .00000082)	(-0.00000000, -0.00000000)	.03260	(.1390518-015, .2346351-015)
23	(-.00000012, -.00000033)	(-0.00000000, -0.00000000)	.03300	(.1999775-015, .7242451-016)
24	(-.00000002, .0000007)	(-0.00000000, -0.00000000)	.03300	(.1193497-015, .4184330-016)
25	(-.00000001, .0000001)	(-0.00000000, -0.00000000)	.03300	(.2736264-016, .4441435-016)
26	(.00000000, .00000000)	(-0.00000000, -0.00000000)	.03900	(.1408143-016, .1108014-015)
27	(.00000000, .00000000)	(-0.00000000, -0.00000000)	.03300	(.1223756-016, .1182797-016)

TABLE 26 FOR Z=-(9.0,-4.0)

N	JN	BESL. EQ.	TIME	REL. ERROR
1	(5.62811134, 3.89716409)	(.0000018873, -0.0000004364)	.02280	(.1332549-016, .1924409-006)
2	(-4.41358755, -4.72678839)	(-0000052392, -0000011836)	02320	(-4404093-007, -4112274-007)
3	(-3.21040237, -4.92342162)	(.0000011006, -0.0000008124)	.02360	(.1490784-007, .9720914-008)
4	(-4.9826558, 1.19158814)	(.0000001644, -0.0000002868)	.03000	(.2252422-008, .9418560-008)
5	(-88116494, -4.16413671)	(-0000000080, -0000000756)	02460	(-2850931-008, -E032800-009)
6	(2.44791018, 2.30867687)	(-0000000051, -0.000000159)	.02540	(.2197235-009, .2329747-009)
7	(2.46423514, -38231413)	(-0000000023, -0.000000026)	.02600	(.4478519-010, .2886664-009)
8	(-97377249, -1.38263988)	(-0000000006, -0.00000003)	02640	(-2232415-010, -1572256-010)
9	(-10637759, -1.02777560)	(-000000001, -0.00000000)	.02720	(.3870483-010, .4006052-011)
10	(-38854891, -41281195)	(.000000000, .000000000)	.03380	(.1932686-011, .1819092-011)
11	(-27417763, -05871990)	(-000000000, -0.00000000)	02820	(-4816958-012, -2249156-011)
12	(-11784099, -04421225)	(.000000000, .000000000)	.02880	(.1903121-012, .5072478-012)
13	(-03198762, -04054578)	(.000000000, .000000000)	.02920	(.1150841-012, .9079285-013)
14	(-00279679, -01930323)	(-000000000, -000000000)	.02960	(-2090893-012, -3029435-013)
15	(.00243347, .00637352)	(.000000000, .000000000)	.03020	(.3698036-013, .1411946-013)
16	(.00168530, .00144798)	(.000000000, .000000000)	.03060	(.7966806-014, .9274196-014)
17	(-00066046, -00014994)	(-000000000, -000000000)	.03740	(-.2944874-014, -.1297158-013)
18	(.00018770, -0.0004896)	(.000000000, .000000000)	.03160	(.1457959-014, .5589784-014)
19	(.00003916, -0.0003482)	(.000000000, .000000000)	.03180	(.9558685-015, .1074974-014)
20	(-00000494, -0.0001245)	(-000000000, -000000000)	.03220	(.1007682-014, -.4000629-015)
21	(-0.0000027, -0.0000324)	(.000000000, .000000000)	.03280	(.2384572-014, .1992301-015)
22	(-0.0000039, -0.0000064)	(.000000000, .000000000)	.03300	(.2108813-015, .1265706-015)
23	(-0.0000014, -0.000009)	(-000000000, -000000000)	.03320	(-.7230989-016, -.1112071-015)
24	(-0.0000003, -0.000000)	(.000000000, .000000000)	.03920	(.3482733-016, .2751845-015)
25	(-0.00000001, -0.000000)	(.000000000, .000000000)	.03300	(.2115325-016, .6338889-016)
26	(-0.00000000, -0.000000)	(-000000000, -000000000)	.03340	(.1648137-016, -.1707480-016)
27	(.00000000, -0.000000)	(.000000000, .000000000)	.03320	(.2024732-016, .7610214-017)

APPENDIX A:

LISTING OF SUBROUTINE JNZ

TEXP 30 SUBROUTINE JNZ(JN, NP1, Z, EZ)

C COMPUTES BESSSEL FUNCTION OF 1ST KIND FOR COMPLEX ARGUMENT FOR
C ABS(Z) EQUAL TO OR LESS THAN TEN.

COMPLEXX16 Z, JN, EZ

C JN EQUAL COMPLEX VALUE OF BESSSEL FUNCTION.
C NP1 EQUAL INTEGER ORDER OF BESSSEL FUNCTION.
C Z EQUAL COMPLEX ARGUMENT.
C EZ IS A DOUBLE PRECISION COMPLEX NUMBER WITH THE REAL
C AND IMAGINARY PARTS BEING UPPER BOUNDS FOR THE MAGNITUDES
C OF THE RESPECTIVE PARTS FOR THE RELATIVE ERROR IN JN.

DOUBLE PRECISION ZERO,X,Y,RHO,PHI,SI,CI,THETA,U,V,D,ARG,D1,D2,
1D3

ZERO=0.0D0
X=DREAL(Z)
Y=DIMAG(Z)
RHO=X**2+Y**2
RHO=DSQRT(RHO)
PHI=DATAN2(Y,X)
THETA=NP1*PHI
SI=DSIN(THETA)
CI=DCOS(THETA)
D=NP1+1

C SERIES COMPUTATION FOR BOTH REAL AND IMAGINARY PARTS.
C U IS REAL PART.

29*

EDIT
30*P 30
C V IS IMAGINARY PART.
C

```
U=CI/DGAMMA(D)
V=SI/DGAMMA(D)
K=1
10 L=2**K
      X=D+K
      Y=K+1
      ARG=(NP1+L)*PHI
      U=U+(-1)**K*RHO**L*D COS(ARG)/(2**K*2**K*D GAMMA(Y)*D GAMMA(X))
      U=U+(-1)**K*RHO**L*D SIN(ARG)/(2**K*2**K*D GAMMA(Y)*D GAMMA(X))
      D1=RHO**L/(2**K*2**K*D GAMMA(Y)*D GAMMA(X))
      IF(D1.EQ.ZERO) GO TO 20
      D2=D1/U
      D3=D1/U
      K=K+1
      GO TO 10
20 U=(RHO/2.)*NP1*XU
      V=(RHO/2.)*NP1*XU
      JN=DCMPLX(U,V)
      D2=DABS(D2)
      D3=DABS(D3)
      EZ=DCMPLX(D2,D3)
      RETURN
      END
```

EOF AT LINE 54
54*

APPENDIX B:
LISTING OF PROGRAM
FOR COMPUTING TABLES

```
0x>P 30
      COMPLEXX16 Z1,Z(26),JN,ZJ1,ZJ2,ZJ3,ZJ4,ZJ5,P,
1EZ,EZ1,EZ2
```

```
C      ARGUMENTS FOR TABLES 1 THRU 26, RESPECTIVELY.
```

```
C      DATA (Z(K),K=1,26)/(1.D0,1.D0),(1.D0,9.D0),(2.D0,-8.D0),
1(2.D0,-2.D0),(3.D0,3.D0),(3.D0,7.D0),(4.D0,-6.D0),(4.D0,-4.D0),
2(5.D0,5.D0),(6.D0,-4.D0),(7.D0,3.D0),(6.D0,-6.D0),(8.D0,-2.D0),
3(7.D0,7.D0),(9.D0,1.D0),(8.D0,-8.D0),(9.D0,9.D0),(10.D0,-1.D0),
4(9.D0,2.D0),(8.D0,-3.D0),(8.D0,4.D0),(8.D0,-5.D0),(6.D0,8.D0),
5(5.D0,-8.D0),(8.D0,6.D0),(9.D0,-4.D0),/
```

```
C      GENERATE TABLES 1 THRU 26.
```

```
C      DO 20 I=1,26
21-Z(I)
WRITE(6,10) I,Z(I)
10 FORMAT(1H1,38X,'TABLE',I3,' FOR Z=(',F5.1,',',F5.1,',',/)
WRITE(6,11)
11 FORMAT(1H,'N',24X,'JN',27X,'BESL. EQ.',14X,'TIME',14X,
1'REL. ERROR',/)
```

```
C      COMPUTE JN(Z) FOR N=-1,0,1,2 AND DETERMINE COMPUTATIONAL
TIME.
```

```
C      NP1=1
      CALL JNZ(JN,NP1,Z1,EZ)
      ZJ1=-JN
      NP1=0
```

```
29x>
```

```

EDIT 30x>P 30
      CALL JNZ(JN, NP1, Z1, EZ)
      ZJ2=JN
      NP1=1
      CALL SETCLK
      CALL JNZ(JN, NP1, Z1, EZ)
      CALL LKCLKS(TIME1)
      CALL LKCLKS(TIME2)
      ZJ3=JN
      NP1=2
      CALL SETCLK
      CALL JNZ(JN, NP1, Z1, EZ)
      CALL LKCLKS(TIME1)
      CALL LKCLKS(TIME2)
      ZJ4=JN
      DO 30 J=1,27
      NP1=NP1+1
      COMPUTE JN(Z) FOR N=3 THRU 29 AND DETERMINE COMPUTATIONAL
      TIME.
      EVALUATE BESSEL EQUATION.
      WRITE(6,15) J, ZJ3, P, TIME, ZJ1
      ZJ1-EZ
      P=Z1*xz/4.*((ZJ1+x.*ZJ2-x.*ZJ3-x.*ZJ4+x.*ZJ5)+x.*Z1*xz)
      15 FORMAT(1H ,1I0, J,2J3,P,TIME,ZJ1
      ,',F14.8, ',',F14.8, ',',F14.8, ',',F14.8, ',',F14.10, ','
      ,',F14.10, ','
      59x>

```

```

EDIT
60xx>P *1F14.10,''),F10.5,''
          ('',E14.7,'',',E14.7,'',',',/')

TIME=TIME1
TIME1=TIME2
EZ=EZ1
EZ1=EZ2
ZJ1=ZJ2
ZJ2=ZJ3
ZJ3=ZJ4
ZJ4=ZJ5
20 CONTINUE
20 STOP
END
EOF AT LINE 71
71*x>

```

3-83

DTIC